WILLIAM R. CORWINE.

WILLIAM R. CORWINE, called as a witness on behalf of the defendant, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1. Mr. Corwine, will you give your place of residence?

A. City Club, 55 West 44th Street, New York City.

Q. 2. Have you had any connection with the American Dyes Institute?

A. I was its secretary from May 5th, I think was the date, 1919, until it dissolved, wound up recently, last year.

Q. 3. Do you know who the members of the American Dye Institute were in 1919 and 1920?

A. I do.

Q. 4. Please look at this statement (handing paper). Did you prepare that?

A. Yes, sir.

Q. 5. Is that a correct statement showing which of the firms therein listed were and which were not members of the Dyes Institute in 1919 and 1920?

A. It is correct.

MR. KRESEL: Do you want to cross-examine the witness?

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 6. Can you state of your own knowledge, Mr. Corwine, that these persons named on that list were members of the Dyes Institute in February and March, 1919?

A. I can.

XQ. 7. You know that, do you?

A. I do.

XQ. 8. When did you become secretary?

A. In May, 1919.

XQ. 9. Did you have any connection with it before that?

A. Very intimate personal relations with many of them, yes, sir.

XQ. 10. I mean, did you have an official connection with the association?

A. No.

XQ. 11. And you had never been connected with the association officially up to that time, had you?

A. No, sir. The records were in my possession, though.

MR. ANDERSON: That is all.

RE-DIRECT-EXAMINATION.

By MR. KRESEL:

RDQ. 12. I wanted to ask you about this constitution and by-laws. Can you state when this constitution and by-laws, if ever, was adopted by the American Dyes Institute?

MR. ANDERSON: The best evidence of that is the minutes.

THE COURT: Not the exclusive evidence.

THE WITNESS: May I make a statement, your Honor?

THE COURT: Yes.

THE WITNESS: This was adopted prior to my connection with the institute, but is in the records which are part of the evidence in this case, as I understand it, and this was the working copy which I used in the office and under which I worked during the period that I was there, during the period that the institute itself was in existence.

RDQ. 13. Then your statement is that that was adopted before May, 1919?

A. Yes, sir.

RDQ. 14. And was the constitution and by-laws under which the organization operated?

A. Yes, sir.

RDQ. 15. From the time you went there?

A. Yes, sir.

RDQ. 16. And until it wound up?

A. Yes, sir.

MR. KRESEL: I offer in evidence a statement identified by the witness of the persons or firms who are members of the Dyes Institute and at the same time stockholders of The Chemical Foundation and those who are not such stockholders.

MR. ANDERSON: I object.

THE COURT: Have you the books of the Institute, showing the membership?

MR. KRESEL: The minute books do not show who the members were, and those are the only books that are here in evidence.

MR. ANDERSON: Mr. Kresel, the minutes are in evidence and the records of The Chemical Foundation showing who were the underwriters are in evidence.

MR. KRESEL: But the minutes of the Dyes Institute do not disclose who the members were.

THE COURT: Of the American Dyes Institute?

MR. KRESEL: Of the American Dyes Institute.

THE COURT: And your purpose is to show that of the underwriters of The Chemical Foundation, certain persons were and certain persons were not members of the American Dyes Institute?

MR. KRESEL: That is the purpose. Of course, you know who the stockholders were and who the underwriters were, because that is already in evidence.

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THE COURT: If there is better evidence than that just given from the stand, it seems to me that should be produced. That given from the stand shows that Mr. Corwine had an official knowledge, in connection with the American Dyes Institute, only from May and not prior thereto.

MR. ANDERSON: May I interrupt your Honor? I do not want your Honor to feel that I am technically objecting. If Mr. Kresel will compile a complete list, giving us the verifying data, so that we can check it up, of the members of the Dyes Institute in March, or whenever the underwriting was, February or March, 1919, I think it was, showing the complete list of them, I am perfectly willing to let that list go in of members of the Dyes Institute if it is not in evidence. The list of the underwriters has gone in under stipulation filed with the bill, and the two together show exactly the status with respect to a number of members who underwrote it. If you will make up a complete list of the members of the Dyes Institute, and give us a record from which we can verify it or let us verify it from any reasonable information on the subject, I am perfectly willing to let it go in.

MR. KRESEL: The Government has had the books of the American Dyes Institute in its possession for months. They know more than I do about who the members of the American Dyes Institute were.

MR. ANDERSON: But the books do not show it.

MR. KRESEL: If they do not show it, have I not a right to show it by a man who knows?

MR. ANDERSON: I understood him to say the books did not show it. As far as I am concerned, We have not had the books of the Dye Institute. We have had the minute books here, so far as we

know, and what they show, I cannot recall without going through them. If they will give me a list, I am perfectly willing to stipulate it in the record.

By Mr. Kresel:

RDQ. 17. What access did the Government have to all the books of the American Dyes Institute?

A. Free as possible.

RDQ. 18. Did they take them into their possession?

A. They did.

RDQ. 19. How long did they have them?

A. There were three or four different occasions in which the agents of the Department of Justice visited me and asked me to show them the books, and I did it each time. At one time they were three days, I think, looking over them, besides separate other periods.

RDQ. 20. And did you give them everything you had?

A. Everything, sir.

Re-Cross-Examination.

By Mr. Anderson:

RXQ. 21. And did they look at them at your place?

A. They did.

RXQ. 22. Have they ever been out of your custody?

A. And they also looked at them, Colonel Anderson, where they were stored, in the Newport Chemical Works at Passaic; and I went myself with them and so did Mr. Haynes.

RXQ. 23. And they were in your custody?

A. They were. That is, I was responsible for them.

RXQ. 24. They have been since?

A. Yes.

RXQ. 25. The books outside of the minute books have never been in the custody of the Government, have they?

A. They have been inspected by the Government, sir.

RXQ. 26. I did not ask you if they had been inspected. I asked you whether they had been in the custody of the Government?

A. I do not know what they took out of our files. They took away a lot of stuff.

RXQ. 27. I asked you whether the books and records had ever been in the custody of the Government, do you know, except the minute books which were turned over to us after we got here?

A. As to custody, I do not know. I know that they were inspected.

RXQ. 28. They were inspected. I am not questioning that.

A. (No answer.)

RE-DIRECT EXAMINATION.

By MR. KRESEL:

RDQ. 29. Is there any book which gives a list of the members of the Dyes Institute in February, March and April, 1919?

A. Yes, sir.

RDQ. 30. Where is that book?

A. There was a pamphlet prepared and issued by the American Dyes Institute which was referred to in the record, which has a correct list of members.

RDQ. 31. Have you a copy of that?

A. I haven't it in my possession. There is one here, a photostat copy of it.

RDQ. 32. You mean it is in evidence?

A. I do not think it is in evidence.

RDQ. 33. Is this list that you have prepared, prepared from that record?

A. Yes, sir.

RDQ. 34. Is it correct?

A. It is.

RE-CROSS-EXAMINATION.

By MR. ANDERSON:

RXQ. 35. Is it a complete list of the members of the American Dyes Institute?

A. Yes, sir.

RXQ. 36. All the members in 1919?

A. Yes, sir; showing those who subscribed and those who did not subscribe.

RXQ. 37. It is a complete list, according to the best of your knowledge and belief, of the membership in February and March, 1919?

A. Yes, sir.

MR. ANDERSON: Very good. If the list is complete, I am perfectly willing to let it go in. I have been ready all the time to do that.

THE COURT: Admitted.

Received in evidence and marked "Defendant's Exhibit No. 302." (*See Exhibits, Vol. V, page 3370.*)

MR. KRESEL: I offer the Constitution and By-Laws.

MR. ANDERSON: I object to the introduction of the Constitution and By-Laws because I do not think they have been properly proven.

THE COURT: The evidential value that it has is that it was used as the working set of by-laws during that period. There may be some question involved in connection with that.

Received in evidence and marked "Defendant's Exhibit No. 303." (*See Exhibits, Vol. V, page 3373.*)

MR. KRESEL: If your Honor please, I want to

put in a stipulation upon which we are trying to agree with the Government with reference to the character of the schedule that was attached to the release from the Alien Property Custodian to the Government, dated April 10, 1919. Mr. Boggs tells me he has had the matter up with Mr. Galloway, and they think they can come to an agreement on that tonight. May I reserve that until tomorrow morning? The same time that the Alien Property Custodian conveyed to us the patents, your Honor, he executed an assignment of those to the Government.

MR. ANDERSON: And delivered it to Mr. Palmer.

MR. KRESEL: And delivered it to Mr. Palmer, who was then Attorney General—right. The schedules to that release are not with the exhibit. The release itself is in as an exhibit.

THE COURT: A release for any claims of infringement?

MR. KRESEL: Yes.

Your Honor will recall that the Government put in a very great number of exhibits consisting of memoranda and letters between the officials of the War Department, The Chemical Foundation, and the Alien Property Custodian, all dealing with the Government's interests in these patents. Your Honor will recall the statement was made that the Government wanted these patents; that the War Department was anxious to get them and the Alien Property Custodian grabbed them and gave them to The Chemical Foundation. It was upon that theory that they put in a long line of documentary proof. In that same connection, I want to offer some they did not put in.

First, I offer a letter from Ramsay Hoguet to Captain Swenarton, Office of Chief of Ordnance,

dated February 25, 1919. These are all under our stipulation, Mr. Galloway.

MR. ANDERSON: We have not had copies of them, but you can go ahead.

MR. KRESEL: Yes, you have had copies of them.

MR. GALLOWAY: No, the last list we never received copies of.

MR. KRESEL: Will you please mark that.

Received in evidence and marked "Defendant's Exhibit No. 304." (*See Exhibits, Vol. V, page 3387.*)

THE COURT: Have you any more, Mr. Kresel?

MR. KRESEL: I have quite a number, your Honor. I do not propose to read more than two or three paragraphs out of this whole batch. If your Honor will indulge me ten minutes, I think I can finish; and I am very anxious to finish.

THE COURT: You may proceed.

MR. KRESEL: I offer in evidence a letter from Marston T. Bogart, Colonel, Chemical Warfare Service, United States Army, to Major A. C. Holcomb, with reference to the ownership of alien enemy patents.

MR. ANDERSON: I am not objecting to these except the general objections which are reserved, sir. I would like to reserve the right to check them. I have not had copies. I am allowing the copies to go in without an opportunity to check them.

Received in evidence and marked "Defendant's Exhibit No. 305." (*See Exhibits, Vol. V, page 3389.*)

MR. KRESEL: I offer in evidence a letter from A. C. Holcombe, Major, Ordnance Department, United States Army, to the Chief of the Patent

Section of the Purchase Branch, Purchase, Storage & Traffic Division.

Received in evidence and marked "Defendant's Exhibit No. 306." (*See Exhibits, Vol. V, page 3392.*)

MR. KRESEL: I offer in evidence a memorandum for Colonel Hilton made by Major Holcomb, dated May 1, 1919. Before the clerk marks this exhibit, I desire to read one paragraph therefrom. (Reading.)

Received in evidence and marked "Defendant's Exhibit No. 307." (*See Exhibits, Vol. V, page 3393.*)

MR. ANDERSON: I wish to reserve a special objection to that letter. It does not appear who Major Holcombe is. I have asked several times where he is. I had expected to get that information from another witness that you were going to call, Mr. Kresel, who for reasons which we have not gone into yet has not been called. I have no objection to it if we can agree as to who Mr. Holcombe is, where he is now, and what he is doing, and where he has been since May, 1919, or about that time.

MR. KRESEL: I do not care anything about where Mr. Holcombe is now. I do not know anything about him and I do not care anything about him. He was a Major of the United States Army and in his official capacity wrote that letter. The Government has put in letter after letter from Major Holcombe. Why this plea of ignorance about who Major Holcombe is? You put in communications from him.

MR. ANDERSON: The only thing is, I have been waiting here for one of your witnesses to go on the stand that I might ask the question.

MR. KRESEL: Well, suppose you ask me the question. I may be able to answer it.

MR. ANDERSON: That is exactly what I was going to suggest. I was going to take it up with you later. I would rather ask you out of court.

MR. KRESEL: Ask me right now. What is the secret about it?

MR. ANDERSON: Has not Major Holcombe been connected with the firm of Emery, Varney, Blair & Hoguet since some time in May, 1919?

MR. KRESEL: I understand that he has been, though I do not know what time.

MR. ANDERSON: As their Washington representative?

MR. KRESEL: I do not know whether he was the Washington representative; but if you say so, I will concede it. Now, is the whole secret out?

MR. ANDERSON: Not all, but a part of it.

MR. KRESEL: I offer in evidence a letter from J. M. Wainwright, Acting Secretary of War, addressed to the Chairman of the Committee of patents of the United States Senate, dealing with the question of patents, dated August 19, 1921. I shall not stop to read these. They are entirely too long.

Received in evidence and marked "Defendant's Exhibit No. 308." (*See Exhibits, Vol. V, page 3395.*)

MR. KRESEL: I offer in evidence a letter from Charles E. Yetman, Patent Section, Purchase, Storage & Traffic, War Department, dated January 30, 1920, directed to Robert C. Goldstein, Chief Division of Patents, Alien Property Custodian.

Received in evidence and marked "Defendant's Exhibit No. 309." (*See Exhibits, Vol. V, page 3399.*)

MR. KRESEL: I offer in evidence a letter from

P. C. March, Acting Secretary of War, to the Secretary of the Navy, dated March 19, 1921.

May I read a paragraph from this? (Reading.)

MR. ANDERSON: What is the date of that?

MR. KRESEL: March 19, 1921, from the War Department.

Received in evidence and marked "Defendant's Exhibit No. 310." (*See Exhibits, Vol. V, page 3400.*)

MR. KRESEL: I offer in evidence letter from Charles B. McVay, Jr., Rear Admiral, United States Navy, to Chemical Foundation, Inc., attention—Dr. Van Doren.

Received in evidence and marked "Defendant's Exhibit No. 311." (*See Exhibits, Vol. V, page 3401.*)

MR. KRESEL: I offer in evidence a letter from Charles B. McVay, to The Chemical Foundation, Inc., dated March 30, 1921.

Received in evidence and marked "Defendant's Exhibit No. 312." (*See Exhibits, Vol. V, page 3402.*)

MR. KRESEL: I offer in evidence an extract from the minutes of a special meeting of the Munitions Patents Board, held December 17, 1918, at which there were present, Mr. Thomas Ewing, Chairman; Major A. Holcombe, and Mr. Pickens Neagle, held in the State, War and Navy Building. I read the following extracts from the minutes (reading):

Received in evidence and marked "Defendant's Exhibit No. 313." (*See Exhibits, Vol. V, page 3403.*)

MR. KRESEL: I trust your Honor will bear in mind that that was December 17, 1918, and I now come to an extract from the minutes of the same

board, April 23, 1919, which wound up with this statement (reading):

Received in evidence and marked "Defendant's Exhibit No. 314." (*See Exhibits, Vol. V, page 3405.*)

THE COURT: What is the date of that?

MR. KRESEL: April 23, 1919. I offer in evidence an extract from the minutes of a meeting of the Munitions Patents Board, dated February 10, 1919, and I read from it this paragraph (reading):

Received in evidence and marked "Defendant's Exhibit No. 315." (*See Exhibits, Vol. V, page 3408.*)

MR. KRESEL: I am almost through, but there are some odds and ends I want to take up in the morning.

THE COURT: We will adjourn until 8.30 o'clock, standard time, tomorrow.

(Whereupon at 4.45 P. M., an adjournment was taken until Friday, July 20, 1923, at 8.30 o'clock A. M., Standard time.)

July 20, 1923.

MR. KRESEL: I have a few more documents that I want to put in. We have agreed with the Government to put in a statement of the various pieces of literature that were sent out by The Chemical Foundation; and I have a list here which I desire to put in which shows the date when sent, the name of the piece of literature describing it, and to whom sent. I have the documents here, and our understanding is that while they are going to be in evidence, they are not to be printed. That was our understanding yesterday. I suggest that the clerk take these and mark them at his leisure

There are quite a number. There is no need to stop for that now.

MR. ANDERSON: Subject to the objections put in on yesterday, sir.

List above referred to received in evidence and marked "Defendant's Exhibit No. 318." (*See Exhibits, Vol. V, page 3421.*)

MR. KRESEL: Furthermore, I desire to put in on the record a stipulation with the Government with reference to Exhibit 85-A, which was the release executed by the Alien Property Custodian to the Government, covering all of the patents that were conveyed by the Alien Property Custodian to The Chemical Foundation by the assignment dated April 10, 1919. The stipulation is this: That subject to correction,

IT IS AGREED that the schedules attached to that release were the same schedules that are attached to the conveyance to The Chemical Foundation of the same date.

MR. ANDERSON: I wish to state in connection with that, if your Honor please, that I am informed that someone has seen that paper in the Department of Justice, it having been delivered to Mr. Palmer as Attorney General. We have been unable to locate it, on request of counsel for production. Therefore, while we do not know it to be a fact, from information we have we believe that such a schedule was attached to the release. Whether it contains all or not, we do not know, but until we can find it or check it, or something to the contrary appears, we feel that that fact for whatever it may be worth may be put on the record, reserving the right to modify it if we find the paper to show otherwise.

MR. KRESEL: I offer in evidence a memorandum from Mr. Caton to Colonel Miller, the Alien

Property Custodian, and I desire a stipulation that Mr. Caton was the director of the Bureau of Trusts of the Alien Property Custodian in 1921. Is that correct, Mr. Galloway?

MR. GALLOWAY: He was. I cannot say whether he was at that date or not.

MR. KRESEL: This, your Honor, is a memorandum with reference to the dispute about the seizure of a patent from a man named Blass. Your Honor will recall the Government put in certain correspondence with reference thereto.

THE COURT: Yes.

Received in evidence and marked "Defendant's Exhibit No. 319." (*Same as Plaintiff's Exhibit No. 481. See Exhibits, Vol. II, page 893.*)

MR. KRESEL: We desire to offer in evidence the second prospectus of The Chemical Foundation, which is Exhibit 8 attached to the answer. Probably by inadvertence, counsel for the Government did not put this one in evidence. He did put in the first one, and I now offer the second one. It is Exhibit 8 to the answer.

Received in evidence and marked "Defendant's Exhibit No. 320." (Same as Exhibit 8 to Defendant's Answer. *See Record, Vol. I, page 583.*)

MR. KRESEL: I offer in evidence report of the British Mission appointed to visit enemy chemical factories in the occupied zone engaged in the production of munitions of war, of which commission there were six American representatives, which report is printed at page 210 of the hearings before the Committee on Ways and Means on H. R. 2706; and in this connection I direct attention to the fact that the Government has already put a portion of this report in evidence, which is contained in the speech of Mr. Garvan, put in evi-

dence by the Government. I cannot recall the exhibit number, but it is attached to our answer, and the Government put it in as one of its own exhibits. A portion of that report being in, I now offer the balance of it.

MR. ANDERSON: I object, if your Honor please, to that report. We put in so much as Mr. Garvan used in his speech; and he being president of The Chemical Foundation, his speech is legitimate evidence against The Chemical Foundation, and any citation he might make in that speech, he adopts. But that does not, in my judgment, justify the introduction of the entire report of the British Mission, and it is not evidence before a Court of the United States.

THE COURT: Without taking time to go into it now, I understand your objection, Colonel Anderson. Unless the defense establishes a right to use it at the time of argument, it will not be considered by me.

Received in evidence and marked "Defendant's Exhibit No. 321." (*See Exhibits, Vol. V, page 3437.*)

MR. KRESEL: I now desire to read two extracts from the testimony of Secretary of War Baker, given before the Committee on Military Affairs of the House of Representatives in its investigation of Atmospheric Nitrogen in the Operation of Muscle Shoals. That is the proceeding, your Honor, from which Colonel Anderson read a portion of General William's testimony.

MR. ANDERSON: Is it the same proceeding?

MR. KRESEL: The same proceeding. Do you want to see General William's? It is right here.

MR. ANDERSON: Under the general rule under which we are proceeding the paper can be read;

your Honor has ruled upon it a great many times —reserving our objection.

THE COURT: Yes.

MR. KRESEL: I read from page 8 one paragraph, then from the tenth page one paragraph, rather than put it in evidence.

THE COURT: This will be read into the minutes?

MR. KRESEL: Into the record.

THE COURT: Yes, rather than marked.

MR. KRESEL: Yes, sir.

MR. ANDERSON: Subject to the objection.

THE COURT: Yes.

MR. KRESEL: Secretary Baker says as follows:

"Plant No. 1 was erected under the general guidance of the General Chemical Co. of the United States, which is one of the largest commercial chemical agencies in this country, really scientific in its processes, and which believed it had a modification of the Haber process, which would be available to us. The Haber process is distinctly a German process. It produces artificial nitrates by a combination of nitrogen—getting the nitrogen from air—under very high pressures at high temperatures. It was thought by the gentlemen of the company that they could modify that so as not to need such high pressure, which was one of the difficulties. Plant No. 1, as I remember, has cost something like $13,000,000. At the time of the armistice, while it was practically a completed plant, all of these difficulties had not been overcome. One was with the catalyzer, which was an unstable thing and needed further scientific research, and the other was the adjustment of some of the pressures, a mechanical difficulty. Both of those difficulties, it is thought, can be overcome by some further research, and is still, to that extent, in an experimental but a hopeful condition."

I read from page 10 the following questions and answers, the questions being put by Mr. Anthony, who was one of the Congressmen:

"Mr. Anthony. How far have the Muscle Shoals plants been brought into production?

"Secretary Baker. The No. 1 plant has made some runs, just to demonstrate the process, and the No. 2 plant has produced, all told, some 6,000 tons, if I recall, of cyanamid.

"Mr. Anthony. That is all nitrogen suitable for explosives?

"Secretary Baker. No; that is nitrogen suitable for fertilizer, but not in the best form—not in the form that the farmers are most accustomed to using it.

"Mr. Anthony. That is under the cyanamid process?

"Secretary Baker. Yes, sir.

"Mr. Anthony. Which you said is the most expensive?

"Secretary Baker. No, Mr. Anthony; quite the contrary. The arc process is the most expensive. The cyanamid process is the cheapest, and it is the only one that is already in commercial use on this continent.

"Mr. Anthony. Is that cheaper than the German process?

"Secretary Baker. The Haber process?

"Mr. Anthony. Yes, sir.

"Secretary Baker. It is the cheapest of any form of electric process that we now operate. It may be that the Germans make it cheaper than that. We do not know all the secrets."

From the same proceedings I desire to read one paragraph, a statement made by General Williams that is found on page 58, talking about the Muscle Shoals plants:

"General Williams. Our first thought was not to operate these plants as Government enterprises but to interest private capital and get them to con-

tinue the operation, and we tried for six months, in every way that we could, to interest the manufacturers in taking over this plant, but without success. Now, as I said before, our primary concern being the maintenance of a plant like this in operation for a war insurance, the only way that we saw to accomplish it was by recommending that the Government take this plant and operate it."

I also desire to read, from this same volume, a statement made by Mr. George J. Roberts, who, I understand had some connection with the War Department with reference to the fixation of nitrogen. This is found at page 95 of this volume, and I read one paragraph:

"The question naturally arises, Why does not private industry undertake the operation of these plants? I shall not attempt to give what is in the minds of those who are most interested in the production of nitrates in this country. All I can state is that months of time were expended attempting to get the fertilizer industry interested in taking over and operating the Government plants. The presidents of all the large fertilizer companies in the United States were seen and the matter fully discussed with them, and they were asked if they would undertake the operation of these plants if they were to pay no rental to the Government until they had received 9 per cent. of their working capital, and after that the profit should be divided between them and the Government. A part of the agreement was that the United States would complete the plants so as to provide storage and bagging facilities, a sulphate of ammonia plant and all the work outlined in Mr. Glasgow's letter of October 22. But they could not be brought to the point of making a formal offer. An effort was also made to get certain financiers in New York to undertake to form a company to operate these plants. Scant consideration was given to the

scheme and no investigation undertaken. An appeal was likewise made to the coke oven interests, with the same result."

I now offer in evidence a report of Theodore W. Sill, Major, Chemical War Service, United States of America, entitled "American Officers and German Chemical Plants—the Dyestuff Plants and their War Activities," presented to the Committee on Ways and Means of the House of Representatives in its investigation of H. R. 2706, which is printed at page 173 of those proceedings.

THE COURT: Is that a report of the same gentleman who was here?

MR. KRESEL: I do not think that is the full report, your Honor. That is, I think, a partial report made by this same gentleman, showing just what he saw abroad. But I do not think it is the complete report. The Government is trying to get for us the complete report.

MR. ANDERSON: Subject to the same objection.

THE COURT: Yes.

Received in evidence and marked "Defendant's Exhibit No. 322." (*See Exhibits, Vol. V, page 3448.*)

MR. KRESEL: I shall not stop to read any portion thereof at this time, your Honor.

I offer in evidence a portion of the Annual Report of the Federal Trade Commission for the fiscal year ended June 30, 1918, that portion being headed, "Licenses under Enemy Patents, Trademarks and Copyrights," which commences at page 44 of this report and extends to the middle of page 49.

Received in evidence and marked "Defend-

ant's Exhibit No. 323." (*See Exhibits, Vol. V, page 3456.*)

MR. KRESEL: Colonel Anderson, you asked Dr. Bolton to prepare for you a list showing the dates when the duPont Company first produced these various dyes. Here is the list. Do you desire to put it in evidence? You remember, he gave you a partial list from memory; but that is the complete list.

MR. ANDERSON: I might have to ask Dr. Bolton to go on the stand for just a minute.

MR. KRESEL: Certainly, there is no objection.

ELMER K. BOLTON, recalled for further examination, having been previously duly sworn, testified as follows:

MR. KRESEL: You question him about it.

By MR. ANDERSON:

RXQ. 492. I asked you, Dr. Bolton, when you were first on the stand, if you could give me a statement showing the date of beginning of commercial production of the various dyes which were manufactured by the duPont Company under the various licenses which have been discussed. Have you that statement?

A. That is the statement, Colonel.

RXQ. 493. This shows the date on which you began commercial production, is that it, or industrial production, if I may call it that?

A. Yes, sir. This is the time when we came through with the first cost sheets for these different dyes.

RXQ. 494. In manufacture?

A. In manufacture, yes.

RXQ. 495. As distinguished from laboratory?

A. As distinguished from laboratory.

MR. ANDERSON: Then I would offer that in evidence, sir.

Received in evidence and marked "Plaintiff's Exhibit No. 662." (*See Exhibits, Vol. III, page 1652.*)

MR. KRESEL: You also asked Dr. Bolton to give you a statement of the Schultze numbers; do you remember?

MR. ANDERSON: Yes.

MR. KRESEL: Here is a statement of that.

RXQ. 496. You identify this as a correct statement of the Schultze numbers as applied to various dyes manufactured by the duPont Company under these licenses, is that true?

A. Yes, sir. That is all the information in Schultze relative to the composition of the dyes which we are manufacturing.

MR. ANDERSON: I offer that in evidence.

Received in evidence and marked "Plaintiff's Exhibit No. 663." (*See Exhibits, Vol. III, page 1653.*)

MR. KRESEL: I shall raise no objection, your Honor, except the objection that I made when this question was first brought up by counsel for the Government, and that is that any statement made by Schultze in his work is not evidence, and is not binding upon this defendant.

You also asked for the patents covering the manufacture of phenyglycene—something else, do you remember? There it is (handing paper).

RXQ. 497. You prepared, Doctor, this statement showing the patents covering intermediates of indigo about which I asked you?

A. Yes, sir.

RXQ. 498. These are the intermediates of indigo, so far as you know (handing paper)?

A. That covers phenylglyceneorthocarboxylic acid. There is another statement for phenylglycene.

RXQ. 499. You hand me now two statements, one entitled "Patents covering the manufacture of phenylglycene which can be used as an intermediate for indigo," and the other, "Patents covering the manufacture of phenylglycene——

A. ——orthocarboxylic acid.

RXQ. 499. (Continued.) Thank you—which can be used as an intermediate for indigo. Those two statements are correct as to the patents covering that subject?

A. Yes, sir.

MR. ANDERSON: I will introduce those statements as exhibits.

Received in evidence and marked respectively "Plaintiff's Exhibits 664 and 664-A." (*See Exhibits, Vol. III, pages 1653, 1655.*)

RXQ. 500. Is the question of purity of ingredients in the manufacture of dyestuffs one of importance in making colors?

A. It is of paramount importance.

RXQ. 501. As an expert chemist in that matter, when a formula is presented for manufacturing a certain color, do you, as one skilled in the art, assume the necessity for pure materials and ingredients?

A. That is the first principle which is taught to the research man when he undertakes research in the university—that you must carry out the work with pure materials.

RXQ. 502. Purity is a fundamental and is assumed by all persons skilled in the art, is it, in the manufacture of such materials?

A. Yes, sir.

RXQ. 503. That applies to all chemical and organic processes for the production of chemicals for other uses?

A. That is a fundamental principle in the field of organic chemistry.

MR. ANDERSON: That is all.

(Witness excused.)

MR. KRESEL: I move now, your Honor, that Thomas W. Miller, as Alien Property Custodian, be made a party to this proceeding. We do this upon the ground that in order that the adjudication in this case may be a final adjudication, in our opinion the United States Government is not a proper party, although we do not move to strike its name from the bill. We do believe, however, that Thomas W. Miller, as Alien Property Custodian, is not only a proper but a necessary party, and so we move that his name be included as party plaintiff.

MR. ANDERSON: If your Honor desires to have that question argued, I would have to ask time, as I have had no notice of this motion whatever to prepare for the argument.

MR. KRESEL: I think that might well be argued at the final argument.

THE COURT: May I see if I understand this motion, Mr. Kresel?

You say that he is not only a proper party but a necessary party. Do you go so far as to state that your belief is that he is an indispensable party?

MR. KRESEL: I think so, your Honor.

THE COURT: I wonder if I can get what is in my mind just by one or two inquiries. Is it your thought that the United States cannot maintain this suit?

MR. KRESEL: That is our belief, sir. Our belief is that the title to this property is in the Alien Property Custodian.

THE COURT: It seems to me there is a conflict

of contentions here, probably on your part, Colonel Anderson, in this way: With respect to the sale of these patents you have asserted, as I recall it, that the power of sale was in the Alien Property Custodian and not in the President, and that he had no power to authorize a private sale, and it seemed to me that the Government as plaintiff possibly conflicted with that in a way. I will not go into it now. I have not tried to think that problem through, as a matter of fact. It may be very patent one way or another. If I understand you, you made no objection to the Government's joining the Alien Property Custodian now and proceeding with two plaintiffs?

MR. KRESEL: Exactly, sir.

THE COURT: Do you agree whether you will then, if joined, make any objection to a misjoinder?

MR. KRESEL: No, we shall make no objection of that sort.

THE COURT: That is what I wanted to get clear.

MR. KRESEL: Certainly.

THE COURT: Then if it develops that the Alien Property Custodian is an indispensable party, or is, in fact, the only person who may maintain this suit, that is, if the United States cannot maintain this suit, the alternative would be a dismissal of the bill, would it not? So that what I wanted to get was whether you were going to make any application for judicial action by reason of misjoinder in the event that the Alien Property Custodian is joined as a party plaintiff.

MR. KRESEL: No, we did not contemplate that at all. We want an adjudication here that is going to be binding, whatever the adjudication may be, because we do not want to have an adjudica-

tion here with the Government, as the sole plaintiff and then have some Alien Property Custodian come along and say, "Well, I was not a party to that suit. I will bring a suit and start *de novo.*" We want to get through once for all.

MR. ANDERSON: I take it that the Government either stands here as the proper plaintiff to bring this suit, which would be binding upon all its officers, because its officers are only agents of the Government; or it is not the proper plaintiff and the suit should be dismissed.

I think, in the first place, the motion is not a timely motion. It should have been made at the beginning of the proceeding and not at the end of it, because if Colonel Miller, as a party plaintiff, has any independent right different from that of the Government, he is entitled to try the case, and he has not been here to try the case. I have not represented him, except as I represent the entire Government organization in this proceeding.

The intangible thing called the Government of the United States is a corporate organization, and all of its agents, I suppose, to that extent are represented and to that extent are bound, but if the decision here is that the Alien Property Custodian is so independent of the Government of the United States that this proceeding would not be res adjudicata as to him, then the proceedings of the trial up to this time are void as to him. You can not adjudicate his rights after it is over.

THE COURT: I cannot compel a joinder of plaintiffs, I take it, at this time. The reason for asking Mr. Kresel the question was to see whether there was any advantage to be taken of that, if the joinder was made.

MR. KRESEL: Has not the Court the right to bring in a party at any stage of the proceeding?

THE COURT: I do not think I can bring in a party. I can dismiss the bill if an indispensable party is absent.

MR. ANDERSON: Or you can dismiss the bill if it is brought by a party who is not interested in bringing the suit or in maintaining it.

THE COURT: Every suit must be maintained by a person entitled to maintain the suit.

MR. ANDERSON: I am perfectly willing to argue those questions whenever counsel are ready, except that I would like time to get the authorities.

MR. KRESEL: That is quite all right. May we reserve that until the final argument?

THE COURT: It will be part of the final argument as to whether the United States is not a proper party.

MR. ANDERSON: I submit my objection that it is not a timely motion and cannot be made at this stage of the proceeding, and I shall oppose the motion on all legal grounds. I am giving specific notice to counsel now so that he may prepare on that question, because I do not think that question can now be decided.

MR. KRESEL: I differ with counsel. My understanding with the rule is that the Court has the power to bring in a party at any stage of the proceeding, and it can make that party either a party plaintiff or a party defendant in order that the adjudication may be a final adjudication between the parties interested.

THE COURT: Or the alternative of dismissal.

MR. KRESEL: Or the alternative. That is not my motion.

MR. ANDERSON: I quite agree on the principles stated that there are certain circumstances, where a party is necessary to the adjudication of

the issues, that that party can be brought into the court in a proper proceeding, under proper conditions, by timely motion. All of those conditions must prevail. But I deny the power to bring parties in and to amend bills even after proceedings have gone very far. They might bring them in if their interests are not prejudiced, but if they were essential at the time of the litigation, their interests cannot be prejudiced by what has gone before they are brought in.

THE COURT: Without passing on it finally, it seems to me there are two things to be considered. I am not passing on it and you may press it on either side. First, the Alien Property Custodian, or Colonel Miller, verified the bill of complaint. That does not make him a formal party, of course. If he is only a proper party, it may be that judicial discretion extends to the requirement that he be made a party. It may be under the new rules that a greater latitude is given than would have existed in a Federal Court of Equity before that. But if the Government of the United States has no right to maintain this action, then——

MR. ANDERSON: Then bringing Colonel Miller in at this stage of the case would not help it.

THE COURT: It might, if he were willing to adopt the proceedings up to this point.

MR. ANDERSON: Then you could not bring him in by an order and require him to do it. He would have to do it of his own volition.

THE COURT: Then it would require a dismissal of the action.

MR. ANDERSON: Yes, sir, that is what it leads to.

MR. KRESEL: Of course, we are not finally arguing this motion.

THE COURT: Oh, no.

MR. KRESEL: And I understand the argument will be reserved until the final argument. But Mr. Mahaffy calls my attention to Rule 37 of the New Equity Rules wherein I find this language: "All persons having an interest in the subject of the action and in obtaining the relief demanded may join as plaintiffs, and any person may be made a defendant who is or claims an interest adverse to the plaintiff. Any person may at any time be made a party if his presence is necessary or proper to a complete determination of the cause."

That is pretty broad language. As I say, I am not finally arguing the proposition; but there is the language of the Equity Rule.

THE COURT: What was the old rule upon which that was founded?

MR. KRESEL: I think the old rule was not quite as broad.

THE COURT: That is a new rule?

MR. KRESEL: Yes. We will brief that subject to your Honor on both sides, I imagine.

MR. ANDERSON: I merely want to say, in regard to that rule, sir, that of course, if the rule permits it, and the Court wants to make Colonel Miller party defendant here, it will not affect the issues very much, but we will object. We had narrowed the parties in this case present, for the purpose of narrowing the litigation as much as we could, but the Court cannot bring in a party plaintiff. He can dismiss the bill, but not make a party plaintiff.

THE COURT: The remaining part of that rule is that persons having a united interest must be joined on the motion of either side as plaintiffs or defendants, so when anyone refuses to join, he may for such reason be made a defendant.

MR. KRESEL: We will consider that a part

of the final argument. I merely wanted to bring the matter to counsel and the Court's attention.

Now, your Honor, there are these matters that I cannot put in now, because the documents have not been produced, and I want on the record to have the reservation and the right to introduce them, when produced by the Government, to wit:

THE COURT: Those are in addition to those mentioned yesterday?

MR. KRESEL: I mentioned some yesterday; but inasmuch as I have put in some today, I should like to repeat that, so that there will be no question as to what I am reserving. I am reserving the right to put in, if so advised, the report of Colonel Joyes, made to the War Department; the papers from the State Department with reference to the Peace Conference, as to which some documents have already been introduced by the Government, and the report of Major Sill to the War Department——all three of those have been requested by us from the Government and the Government is endeavoring to obtain them for us.

MR. ANDERSON: What was the State Department paper? That is a little indefinite.

MR. KRESEL: Mr. Galloway knows what we are asking for. We asked for the balance of the file, a portion of which was here introduced.

MR. GALLOWAY: You asked for the cables between Mr. Bradley Palmer and Mr. Garvan.

MR. KRESEL: That is true.

MR. GALLOWAY: I have this, but it is not separate; I have copies of that here.

MR. KRESEL: All right. Perhaps before the day is over, we shall be able to dispose of that. Furthermore, your Honor, I am reserving the right, with your Honor's permission to produce a

translation of the balance of that French document. I think that will be ready tomorrow morning; and I want to reserve the right to put in a statement which we will agree upon with the other side, as to what legislation was either proposed or enacted with reference to the dye industry. Now, with those reservations, your Honor, the defendants rest.

MR. ANDERSON: With respect to the last paper, while not objecting, I do not wish it to be understood that I have agreed on any statement as to that embargo. I have not examined the records. I will do what I can to reach that agreement, but I do not want to be bound by not saying that I have not agreed.

On the question of the State Department papers, we have produced, or ready to produce today, all the telegrams we can find which the State Department have been able to get for us. As to the report of Colonel Joyes, we shall object to its introduction in any event, although we asked the Department to see if the Secretary of War was willing to let us have it.

MR. KRESEL: When you produce it, we will take that up with the Court.

MR. ANDERSON: We requested that, if the Secretary of War is willing to let us have it, and the same applies to the Sill's report.

MR. KRESEL: Very well.

MR. MAHAFFY: If the Court please, you will recall earlier in the trial, I called attention to the fact that in certain instances the record did not exhibit formally that your Honor had admitted certain documents in evidence as exhibits. Your Honor said that would be taken up later and a general order made to admit them. Since that time, I note on page——

THE COURT: I have expressly refrained from lengthening the record by saying "admitted" a number of times. Each document offered in evidence by either side, up to this point, and any document offered in evidence on the rebuttal, or sur-rebuttal, if they are not expressly rejected, are now admitted formally in evidence.

MR. MAHAFFY: That was my purpose, to avoid any difficulty in the future.

THE COURT: I generally make that statement at the conclusion of the case.

MR. MAHAFFY: The instance I have in mind is President Wilson's message, and it had not been formally marked, and the others were formally marked.

THE COURT: The exhibits referred to are in evidence, although nothing was said at the time they were offered.

MR. MAHAFFY: Thank you, your Honor.

THE COURT: Any rebuttal, Colonel Anderson?

MR. ANDERSON: Has counsel closed?

THE COURT: Yes.

MR. ANDERSON: I did not hear that. Would you withdraw that statement, because I want to make two statements before you close, if you do not object.

MR. KRESEL: Very well.

MR. ANDERSON: I was engaged in conference and did not hear, and I was waiting for counsel to finish. The first is, that as I understand it, under the ruling of the Court, it is not necessary at this time to formally reserve or make any motions to strike out evidence, or reserve exceptions. If that is understood, it can be done by filing the objections that could be made at this time, at any time up to the argument.

THE COURT: That is correct.

MR. ANDERSON: That is what I want to make clear, otherwise we may find ourselves in difficulty. At the time the Government rested on direct, there was a statement by me that we would like at that time, by the consent of counsel, to reserve the right to introduce evidence, with regard to certain papers; and I stated we would do that before the defendant closed his case, on reply. For that reason, I wish to say that I spoke to counsel on yesterday, and understood him to agree that if I desired to put in that evidence I could do it after he closed his case, with leave to him, if he desires, to reply, as agreeable to the Court.

MR. KRESEL: That is quite satisfactory.

THE COURT: Defendant rests?

MR. KRESEL: Defendant rests.

MR. ANDERSON: Mr. Mahaffy, would you make a note that I want to glance over this report of the Federal Trade Commission, and see if there are any additional parts I want to introduce, and you will lend it to me for the time being.

Now, would it be agreeable to your Honor to take a fifteen-minute recess, in order that I may begin the evidence in the way I think I can get it through the quickest, after conference with Mr. Knight.

THE COURT: Recess for fifteen minutes.

PLAINTIFF'S REBUTTAL PROOFS.

MR. ANDERSON: I ask leave to call Mr. Galloway to the stand.

HERMAN J. GALLOWAY.

HERMAN J. GALLOWAY, a witness called in behalf of the plaintiff in rebuttal, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. ANDERSON:

Q. 1. Your full name is Herman J. Galloway?

A. That is right.

Q. 2. You are special assistant to the Attorney General of the United States, a lawyer by profession?

A. I am.

Q. 3. Were you one of the attorneys of the Department of Justice who had charge of the preparation of the case now before the Court, United States of America against The Chemical Foundation, Incorporated?

A. I at least assisted.

Q. 4. Yes. Mr. Galloway, did you have, in the course of the preparation of that case, a search made of the Alien Property office and the Department of Justice for certain records, and especially any correspondence between Mr. Palmer, the former Alien Property Custodian, and Mr. Frank L. Polk?

A. I did.

Q. 5. Could you find any such correspondence bearing upon the order of February 26, 1919?

A. None was found.

Q. 6. Were any papers relating to that or other

matters subsequently returned to you by the defendant in this case or its representative?

A. They were.

Q. 7. At what time.

A. May 21, 1923.

Q. 8. State the facts, please.

A. On that day Mr. Boggs, who is counsel for the defendant in this case, returned to me at my office——

MR. KRESEL: Not "returned," please. Gave.

A. (Continued.) Gave to me.

MR. KRESEL: That is better.

A. (Continued.) In my office in the Department of Justice an envelope containing certain papers. I think there were seventy-two papers in all, and I have a list here of what those papers were which I shall be glad to give you.

Q. 9. Can you recall just what statement Mr. Boggs made to you at that time with reference to that?

A. Mr. Boggs stated to me that these papers had just been found, that they were not—had not been in the custody of Mr. Garvan, but were found in the Washington office of The Chemical Foundation, and I think he said Mr. Keohan found them.

Q. 10. Among the papers so returned was there a copy of the letter from Mr. Palmer, former Alien Property Custodian, to Mr. Polk, the original of which was introduced in evidence through Mr. Polk?

A. There was.

Q. 11. You say you prepared a list of the papers returned to you at that time?

A. I have.

Q. 12. Or given to you at that time?

A. I have.

Q. 13. The papers which were given to you are in your possession, are they not?

A. The papers are intact except for some four or five which have been introduced in evidence here.

Q. 14. And you can identify those?

A. I have a list in pencil, rough notations.

Q. 15. Will you please state what papers were so delivered to you, giving in each case whether it was a copy or original; and if you have prepared a list, I would be very glad if you would file that as your answer or part of your answer, without going to the time or trouble of reading it, subject to check by counsel if they desire?

A. I shall do that.

MR. KRESEL: No objection.

MR. ANDERSON: I ask to introduce that list on the record as a part of the answer of the witness.

THE COURT: Let it be copied by the Stenographer.

MR. ANDERSON: With leave to counsel to check it.

(Answer to Q. 15 continued as follows:)

1. Copy of letter from Assistant Attorney General LaRue Brown to A. Mitchell Palmer, Alien Property Custodian, Esq., Nov. 2, 1918.
2. Copy of letter to Hon. Frank L. Polk, Acting Secretary of State, Feb. 26, 1919.
3. Copy of letter to President, July 11, 1918.
4. Original Office Memorandum to Mr. Garvan from Mr. Dunbar, Feb. 10, 1920.
5. Original Extract from Minutes of meeting of Executive Committee American Dyes Institute, Jan. 22, 1919; list of officers and members attached.
6. Original letter to Hon. A. Mitchell Palmer, Alien Property Custodian, from Ramsay Hoguet, Feb. 10, 1919, with resolution of Manufacturing Chemists' Association of Feb. 4, 1919, attached.

7. Original Memorandum from Alien Property Custodian to Mr. Goldstein, Dec. 27, 1918.
8. Copy of letter to President, July 11, 1918.
9. Original Letter to Hon. A. Mitchell Palmer, Alien Property Custodian, from Ramsay Hoguet, August 8, 1918, enclosing
10. Copy of letter from Hoguet to Hon. J. Harry Covington, August 8, 1918, and
11. Copy of letter from Hoguet to Hon. Federal Trade Commission, August 8, 1918.
12. Memorandum from Alien Property Custodian to Washington Committee on Sales, Feb. 22, 1919.
13. Copy of letter from A. Mitchell Palmer to President, Oct. 31, 1918.
14. Original letter to Hon. A. Mitchell Palmer from Joseph J. Hart, March 22, 1919.
15. Copy of letter to Hon. Breckinridge Long, Oct. 9, 1918.
16. Original Office Memorandum from Mr. Whitaker to Mr. Scott, Oct. 7, 1918.
17. Original letter to Hon. A. Mitchell Palmer, Alien Property Custodian, from Breckinridge Long, Sept. 30, 1918.
18. Copy of letter to Hon. J. W. Wadsworth, Jr., Nov. 1, 1918, with original Memo. from Senator Wadsworth to Alien Property Custodian.
19. Original letter to Hon. A. Mitchell Palmer, Alien Property Custodian, from John Franklin Fort, Nov. 1, 1918, enclosing proposed Executive Order.
20. Original Letter to Hon. A. Mitchell Palmer, Alien Property Custodian, from Ramsay Hoguet, Jan. 16, 1919.
21. Original letter to Hon. A. Mitchell Palmer, Alien Property Custodian, from Ramsay Hoguet, Jan. 15, 1919.

22. Report of Special Committee of the Executive Committee of the Dye Institute in the matter of the conference at Washington, D. C., with the Alien Property Custodian, to be enclosed in letter of Feb. 7, 1919, to Hon. A. Mitchell Palmer.
23. Original letter to Hon. A. Mitchell Palmer, Alien Property Custodian, from H. E. Danner, Feb. 8, 1919, with Report of Special Committee dated February 8, 1919, of American Dyes Institute, attached.
24. Original letter to Hon. A. Mitchell Palmer, Alien Property Custodian, from Ramsay Hoguet, Feb. 4, 1919.
25. Original Office Memorandum to Mr. Goldstein from Mr. Garvan, June 4, 1919.
26. Original Memorandum to Mr. Garvan from Mr. Goldstein, June 4, 1919.
27. Original letter to Hon. Francis P. Garvan from Newton D. Baker, Secretary of War, May 29, 1919.
28. Original letter to Hon. Francis P. Garvan from Franklin Roosevelt, Secretary of the Navy, May 27, 1919.
29. Copy of letter to Hon. Josephus Daniels, Secretary of Navy, Feb. 6, 1919.
30. Copy of letter to Hon. Thomas W. Gregory, Attorney General, August 13, 1918.
31. Copy of letter to Hon. Thomas W. Gregory, Attorney General, July 11, 1918.
32. Original letter to Hon. A. Mitchell Palmer, Alien Property Custodian, from H. B. Rust, June 29, 1918, enclosing copy of affidavit of Charles E. Underwood.
33. Original letter to Hon. A. Mitchell Palmer, Alien Property Custodian, from Joseph H. Choate, Jr., June 29, 1918.

34. Copy of letter to Hon. La Rue Brown, Assistant Attorney General, from A. Mitchell Palmer, June 21, 1918.
35. Original letter to the President from Robert W. Woolley, June 14, 1918, enclosing copy of letter to Hon. Newton D. Baker, Secretary of War, from Woolley and a statement of Mr. Edward M. McIlvain.
36. Copy of letter to Hon. Thomas W. Gregory, Attorney General, from A. Mitchell Palmer, June 14, 1918.
37. Copy of letter to Hon. Thomas W. Gregory, Attorney General, from A. Mitchell Palmer, April 10, 1918.
38. Copy of letter to Hon. John Lord O'Brien, Assistant Attorney General, April 23, 1918.
39. Copy of letter to Thomas Ewing, Esquire, April 17, 1919.
40. Original letter to Hon. Francis P. Garvan, Alien Property Custodian, from Ramsay Hoguet, April 21, 1919, enclosing
41. Copy of letter to Major A. M. Holcombe from Ramsay Hoguet, April 21, 1919, and
42. Original letter to Hon. F. P. Garvan, Alien Property Custodian, from Thomas Ewing, April 15, 1919, also
43. Memorandum from Capt. W. H. Swenarton to Major A. M. Holcombe, April 4, 1919, with attached memorandum of conversation with Dr. J. A. Harker.
44. Copy of memorandum from Munitions Patents Board (signed Pickens Neagle, Acting Chairman) to the Secretary of War, April 5, 1919.
45. Copy of letter to Ramsay Hoguet, April 23, 1919.
46. Original letter to Hon. Francis P. Garvan, Alien Property Custodian, from Ramsay Hoguet, July 1, 1919.

47. Original letter to Alien Property Custodian from W. M. Beard, May 8, 1919.
48. Copy of letter to Mr. W. M. Beard, May 10, 1919.
49. Original letter to Hon. Francis P. Garvan, Alien Property Custodian, from W. M. Beard, May 8, 1919.
50. Copy of letter to Mr. Ramsay Hoguet, April 10, 1919.
51. Copy of letter to Hon. Bernard M. Baruch, July 8, 1918.
52. Copy of letter to Major A. M. Holcombe, April 17, 1919.
53. Copy of letter to Ramsay Hoguet, April 17, 1919, enclosing.
54. Copy of memorandum from Munitions Patents Board to the Secretary of War, April 5, 1919.
55. Copy of letter to Ramsay Hoguet, April 17, 1919.
56. Copy of letter to Alien Property Custodian from Franklin D. Roosevelt, Acting Secretary of the Navy, July 22, 1919.
57. Copy of letter to the Secretary of the Navy from D. W. Taylor, Chief Constructor of the U. S. Navy.
58. Memorandum from the Custodian to Mr. Hoguet, Feb. 12, 1919.
59. Copy of letter to Hon. Francis P. Garvan, Alien Property Custodian, from Ramsay Hoguet, April 11, 1919.
60. Copy of letter to Alien Property Custodian from Chief, Inventions Section, War Department, C. H. Hilton, March 21, 1919.
61. Copy of letter to Hon. Thos. W. Gregory, Attorney General, August 10, 1918.

62. Memorandum from the Custodian to Mr. Bradley, Aug. 9, 1918, with copy of letter to Hon. Thomas W. Gregory, Attorney General, Aug. 9, 1918, attached.
63. Copy of letter to Hon. A. Mitchell Palmer, Attorney General, from Francis P. Garvan, April 15, 1919.
64. Photostat copy of newspaper clipping attached to envelope addressed to C. D. Wetmore, Esq.
65. Original Report of Conference in the office of A. M. Palmer, Alien Property Custodian, Tuesday, June 25, 1918.
66. Constitution, American Dyes Institute.
67. Original letter from American Dyes Institute to A. P. C., Feb. 7, 1919. (Ex. 30.)
68. Copy of letter from A. M. Palmer to President, Oct. 31, 1918.
69. Copy of letter from A. M. Palmer to F. L. Polk, Feb. 26, 1919.
70. Original letter from J. P. Tumulty to F. P. Garvan, Feb. 13, 1920.
71. Original memo. by Ramsay Hoguet to A. M. Palmer, Jan. 28, 1919.
72. Original copy of report of conference in office of Alien Property Custodian, Jan. 27, 1919.

CROSS-EXAMINATION.

By MR. KRESEL:

XQ. 16. Mr. Galloway, as to the copy of the letter from Mr. Palmer, which you say was given to you by Mr. Boggs, do you know whether that was the copy that came from the Alien Property Custodian's office?

A. I cannot say.

XQ. 17. Do you know what became of the copy of the letter that was at the Alien Property Custodian's office?

A. I do not.

MR. KRESEL: That is all, Mr. Galloway.

(Witness excused.)

MR. ANDERSON: I will call Dr. McCoy.

GEORGE W. McCOY.

GEORGE W. McCOY was called as a witness in behalf of the plaintiff, in rebuttal, and being first duly sworn, testified as follows:

MR. ANDERSON: I would like to state, if your Honor please, that there is probably some of this evidence to be given by this witness which would come within the restriction imposed by the Court, in connection with the evidence given by Dr. Stieglitz; and, therefore, I have asked the witness when he reaches that point where he thinks he should give the information in chambers, to so state and I will ask your Honor to take that evidence in chambers.

DIRECT EXAMINATION.

By MR. ANDERSON:

Q. 1. Please state your name and profession and place of residence.

A. George W. McCoy; profession, physician; place of residence, Washington, D. C.

Q. 2. Will you state, doctor, briefly, your education, training and professional experience as a physician?

A. My medical education was received at the University of Pennsylvania. My experience began with service as resident medical officer of the City Hospital of Newark, N. J. After eighteen months in that capacity, I was commissioned in the United States Public Health Service and served at St. Louis, Mis-

souri; San Francisco, California; Manila, Philippine Islands; Mariveles, Philippine Islands; Iloilo, Philippine Islands; Fort Stanton, New Mexico; Washington, D. C.; San Francisco, California, a second time; and on this second occasion in San Francisco I was in charge of the United States Plague Laboratory. This was followed by four years in the Hawaiian Islands, as Director of the United States Leprosy Station, and since 1915 I have been on duty at Washington, as director of the Hygienic Laboratory.

Q. 3. Is that a Government laboratory?

A. It is.

Q. 4. How long altogether have you been in the Public Health Service discharging the duties which you have outlined, can you recall?

A. Just a trifle over twenty-three years.

Q. 5. Prior to your becoming the Director of the United States Hygienic Laboratories, what if any acquaintance had you had with the treatment of diseases treated by salvarsan and arsphenamine and its derivatives?

A. I had a small clinical experience in clinics at San Francisco and Honolulu.

Q. 6. What has been your general experience in connection with the drug named, which it appears here has two names, salvarsan and arsphenamine, or its derivatives, during your position as director of the Hygienic Laboratories?

A. Would you repeat that question, please?

Q. 7. To state it briefly, what has been your experience in connection with this drug or its use by the Public Health Service and its derivatives during your service as director of the Hygienic Laboratories?

MR. KRESEL: I should prefer, Colonel, if you asked the witness what he has done personally. His experience might include all sorts of information coming from other people.

Q. 8. I would like you, in answering your question, to confine your experience to your personal experience or your experience derived from your subordinates officially reporting to you in your official capacity.

Mr. Kresel: No, I shall object to any reports made to him by his subordinates. If those reports are in writing they must be produced.

Mr. Anderson: They are not necessarily in writing.

Mr. Kresel: That has been your contention throughout. If they are not in writing, I want to know who made the reports to him and under what circumstances and when. I think it will tend to clarify if you will ask him first what he knows himself.

The Court: In making your answer, you may first state that which you know from your own personal experience and not from the reports or the reading of medical treatises.

A. The answer to that would be, nothing.

Mr. Kresel: He knows nothing of his own experience.

Q. 9. As director of the Hygienic Laboratory, have you had charge of the inspection or report of drugs? Did you have charge of that work, and what are your duties there?

A. I have had that responsibility——

Mr. Kresel: The question is, what are your duties?

A. (continuing.) And the duties have been to supervise the work of a considerable number of assistants, to pass upon their reports and submit these reports either to my own immediate superiors or to the producers of the drugs in question.

Q. 10. What control does the United States exer-

cise over the production, distribution and use of this product or its derivatives, and through what agencies?

A. The control is through the Public Health Service, which is a branch of the Treasury Department. The control consists of the inspection of the manufacturing plants, the issuing of a license to the plant, requiring that the plant shall submit specimens of the product, and usually, not always, the testing of the product submitted when the sample reaches the Hygienic Laboratory.

Q. 11. How are those tests made, in general?

A. The tests follow two lines: One chemically, the chief object being the determination of the arsenic content; and with that phase of it, I have no further acquaintance except that we do determine the arsenic content. The second is the testing for the poisonous property of the drug, its toxicity, in other words, which is inherent to the preparation submitted.

Q. 12. In general, how are those tests made? I am speaking now particularly of salvarsan and arsphenamine.

A. The toxicity tests?

Q. 13. Yes.

A. They are always, in our laboratory, made by the injection of rats with certain measured doses of the drug and the observing of the animals over a period of a specified number of days, and a determination as to whether or not the drug is too poisonous for use, judged by that test.

Q. 14. Are there any public regulations, published by the United States Government, prescribing these tests and the use of this drug?

A. There are.

Q. 15. Could you produce a copy?

A. Yes, sir. (Handing to counsel.)

By MR. KRESEL:

Q. 16. Is this the latest one, Doctor?

A. This is the one now in effect and the latest one.

MR. KRESEL: This is all right, if you will develop how long it has been in force.

By MR. ANDERSON:

Q. 17. I notice that you have produced a publication of the Treasury Department, United States Public Health Service, Miscellaneous Publication No. 2, Regulations for Control of Arsphenamine, Neoarsphenamine and Sodium Arsphenamine in the District of Columbia and in Interstate Traffic, published at Washington in 1920. How long had those regulations been in force in 1920, Doctor?

A. I cannot answer that without reference to it.

Q. 18. I will be very glad if you would refer to it and state any facts about those regulations and the development thereof.

A. A Government regulation has force from the date of the approval by the final approving officer. In this case they are marked "Approved, June 21, 1920, D. F. Houston, Secretary of Treasury."

Q. 19. Were there any regulations preceding that?

MR. KRESEL: Pardon me a minute. Will you ask him whether they are now in force.

MR. ANDERSON: I am coming to that; prior to the date of this publication and subsequent.

Q. 20. Were there any regulations preceding that; and if so, state generally what period was covered.

A. In a general way, for one year prior to these regulations, there were in force other regulations of the Public Health Service establishing slightly different standards.

Q. 21. Could you state the difference in standards?

A. The essential difference in standard is that the dose that the rats are required to survive is in terms

of 100 milligrams per kilo of rat and immediately preceding that the regulations were 80 milligrams per kilo of rat.

Q. 22. How long was that in force?

A. I cannot say precisely now. In the neighborhood of a year; something of that sort. I did not have an opportunity to get all of these regulations.

Q. 23. Were there any preceding the 80 milligrams per kilo?

A. Prior to that the standard was 60, which lasted a few months, and prior to that the standard was 50, which lasted a few months. Those two earliest regulations, however, were those of the Federal Trade Commission, while they were proposed and recommended to the Federal Trade Commission by the Public Health Service, prepared in our own laboratory. At that time the Public Health Service did not have the legal control of these particular drugs and the control of the Government was exercised through the Federal Trade Commission.

Q. 24. During what years was that period?

A. If I may refer to the memorandum——

Q. 25. Yes, if it was made by you.

A. Yes, it was made by me. The first Federal Trade Commission regulations were dated November 22, 1917, and the second——

MR. KRESEL: The first regulations established what test?

A. (continuing.) That established a rat test and a chemical test, but at a lower grade, 50 milligrams per kilo. Under date of March 4, 1918, the Federal Trade Commission changed those regulations to the 60 milligrams per kilo; and those were in force some months or perhaps a year. I cannot remember just how long.

Q. 26. And then they raised it to 80 milligrams per kilo?

A. Then to 80.

Q. 27. And these regulations of June, 1920, raised it to 100 milligrams per kilo?

A. Yes.

Q. 28. And has there been any change in that particular standard since that time; and if so, what?

A. No.

Q. 29. That is still a regulation?

A. Yes, the standard in effect at the present time.

Q. 30. Were there any other material variations, if you recall, in the earlier published regulations of the Treasury Department than that which you have indicated as to the test per kilo?

MR. KRESEL: Colonel, I must object to that. I have allowed him to give the contents of a written instrument so far.

MR. ANDERSON: I will try to get copies of these others. I was only able to get a copy of this one before leaving Washington. I would like to ask leave to introduce that in evidence, as Plaintiff's Exhibit No. 665.

MR. KRESEL: No objection.

THE COURT: It is admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 665." (*See Exhibits, Vol. III, page 1657.*)

Q. 31. You have stated the control exercised by the United States Public Health Service over this drug and derivatives; how is that control exercised, after the test is made as you have indicated; what is done then?

A. Assuming our test has been satisfactory, the manufacturer is notified in writing that the drug may be released. If the test is unsatisfactory, he is notified that the drug has failed to pass.

Q. 32. Then what happens; I mean in either case?

A. If it is released, I suppose it is sold. That is

the intention of the release, that it may be put into trade channels.

Q. 33. Is there any indication——

MR. ANDERSON: What is that, Mr. Kresel?

MR. KRESEL: I was just saying, I wonder if you would let a witness of mine make that kind of statement.

MR. ANDERSON: Of course I would let him make any kind of statement.

Q. 34. Is there any indication upon the label of such control, and how is it indicated; I have some of those things here. In order to answer the last question specifically, I will ask you to take these two samples, one of neosalvarsan, and indicate exactly, because we have already read that label to death.

MR. KRESEL: I do not object to his stating it without the samples.

A. Of course, the label contains the statement that the material has been tested according to requirements of the Public Health Service, and it also has on it a lot number, in this one case 640, and in this case 956.

Q. 35. What does that lot number indicate?

A. Well, it is required by the regulations that every batch the manufacturer produces shall be given a lot number for the purpose of identifying every dose that comes away from the plant.

Q. 36. And is it or is it not a fact that all of that batch so tested is sold under that lot number, every dose of it?

A. The regulations require that.

Q. 37. Doctor, can you state what domestic manufacturers of salvarsan and arsphenamine and their derivatives were licensed to manufacture those products in the United States?

MR. KRESEL: If your Honor please, I have not raised any objection to any question thus far, because I understood it was simply introductory of

something which is really rebuttal. I think, sir, in this case of all cases counsel should be restricted to strict rebuttal, unless the purpose is to contradict somebody as to who the licensees were. It is not strict rebuttal.

If counsel will say that this question is for the purpose of showing that the testimony in the case as to licensees is wrong, I say that question is objectionable because it is not strict rebuttal. I am raising it, your Honor, because I want, if possible, to cut this short. I do not think that we ought to go over the same ground on rebuttal that has already been gone over on the direct and the cross.

MR. ANDERSON: If your Honor please, I did not show who were licensees of salvarsan in the United States on direct. It was brought out. I am not sure whether there would be any added if this question were answered or not, because I have not the data before me; but I do not agree with counsel on the subject of the rules to be applied to this case, and I might just as well state our respective positions now.

While undoubtedly there are certain general principles which control rebuttal, I think it would be a most unusual and harsh doctrine and one most prejudical—I do not mean that in any sense of unpleasantness—to the interests of the plaintiff in this case if the rules were changed in the progress of the game.

I am going to put on very little evidence in rebuttal. It is not my purpose to go outside of the reasonable limits of rebuttal testimony. It is necessary, however, to lead up to that testimony and to establish certain collateral facts which make that testimony appropriate, and I think, instead of having the strictest rules applied, the Govern-

ment is entitled to the same proportionate latitude in rebuttal that has been given elsewhere.

I do not mean to say that we can open up new problems or new questions. I do not mean to say that we can go into an unlimited field. But I do mean to say that since the rules have been so liberal throughout this case, a sudden drawing in of the rules would be especially injurious to the plaintiff. That is obvious, for the reason that in the original evidence we had to break our way with practically no guide as to the rules. I say that again. It is not in any way suggestive of criticism, but a recognition of the liberal attitude of the Court on this subject. Nevertheless, we had no idea where we were going to land in this case. We had to anticipate as far as we could any phase of the case that might arise.

Now, if we are limited absolutely in rebuttal with regard to the defense which we have to meet, we have never had an opportunity to meet that situation. We introduced on this subject only evidence of value, that is all, and all this discussion of the patents and the patent rights, of the method of production and control, of the number of licensees, of the positions of the licensees, every bit of that was brought out in the defendant's case.

Now we were limited greatly in re-direct, because re-direct must be limited rather strictly in these questions, and that was strictly enforced; of course, I mean objected to as not re-direct. Now, if we are precluded from bringing out the evidence and bringing it out rather fully, I submit that it would be prejudicial and would not achieve the aims of justice.

Mr. Kressel: I deny the imputation that anyone is seeking to change the rules of the game. Your Honor very early in this case gave notice

to counsel that the liberal rules that your Honor was enforcing throughout the direct case of the plaintiff and that of the defendant would not be applied upon rebuttal. I remember distinctly that your Honor directed Colonel Anderson's attention to that, and your Honor stated, if I recall it correctly, that the rules of evidence would be strictly enforced upon rebuttal. It is that that I am asking. I deny that I am seeking the change of any rules of the game.

THE COURT: I take it that it is a question as to what the record will disclose, and that is long before the Government was through with its testimony in chief it was announced by the Court that the admission of all evidence offered, under which rule we were then proceeding for the reasons stated at the beginning of the trial of this case, would not apply to the testimony in rebuttal. You will probably recall, Colonel Anderson, that just before you closed I asked you whether there were any matters which you wanted to put in which had been ruled out, and if so you were free to put them in. My recollection is that again at that time, although I am not as positive of that as I am of the other, it was announced that the rule under which we were proceeding would not apply to rebuttal. The reason that it will not apply in rebuttal—and it will not and should not—is that that would enable the plaintiff to put in any rebuttal testimony which would be proper only in chief. You will recall, Colonel Anderson, that you said you had put in many papers and much evidence under the liberality of the rule because you had been advised that it would not apply to rebuttal.

However, the rebuttal, of course, is as wide as the evidence put in by the defendant. The lib-

eral rule under which we have proceeded so far would be an unjust rule to apply to rebuttal, but the rebuttal rule under which we now operate enables you to meet any evidence that was put in by the defense, but it does not enable you to go beyond that.

What is the evidence to which the testimony now sought to be elicited is in reply?

MR. ANDERSON: Really, the question and the immediate question was introductory, for the purpose of connection and of orderly statement, to the evidence which I proposed to introduce by this witness in reply to the evidence of Dr. Stieglitz.

Your Honor will bear me out, I think, that all the evidence attacking these patents or processes described therein was brought out by the defense. It was a matter not touched upon before; the validity of the patents was assumed.

THE COURT: I do not have any recollection of any evidence which this testimony or the answer to this question would meet. I think I recall pretty clearly the complete testimony of Dr. Stieglitz, but I do not recall this testimony.

MR. ANDERSON: In response to your Honor's statement, I quite agree that the rule of liberality should not be applied to rebuttal to the extent that your Honor indicated—I mean that you thought would be wrong. In other words, the unlimited rule of evidence is practically a rule prevailing before a Master, applied to the case in chief and the defense, and would not apply to rebuttal as a matter of general practice; but the same proportionate liberality in my judgment should be allowed in rebuttal. That is all that I meant in my original statement; I do not wish to add to it in any way.

THE COURT: I do not recall any testimony introduced by the defendant to which this would be in reply. Objection sustained.

MR. ANDERSON: I take an exception, sir.

Q. 38. Doctor, do you know whether prior to the control by the Public Health Service there were licenses issued for the manufacture of this article by the Federal Trade Commission? Do you know anything about that?

MR. ANDERSON: That evidence is in, but I merely want to connect it up.

A. Yes, there were.

Q. 39. Has the Public Health Service under your direction undertaken to secure data on deaths or serious reactions from the use of salvarsan or arsphenamine and its derivatives from reports of its own officers and from other reliable sources, and have you as chief of the Public Health Service any data on that subject?

MR. KRESEL: One minute, please. I object to that on the ground, first, that it is leading; second, upon the ground it is not proper rebuttal.

MR. ANDERSON: I think it would be a rather remarkable circumstance, sir, that counsel could come in here at the Bar and state that the American soldiers have been killed by the use of salvarsan and neosalvarsan, attack by name one manufacturer, bring in a lot of evidence on that subject, and then we be forbidden to come in and prove the facts as to that subject.

MR. KRESEL: I am not attempting to do that at all. On the contrary, I deny I am attempting to do it.

THE COURT: Colonel Anderson, are you attempting by this evidence to meet the statements

of counsel or are you attempting to meet the evidence put in by the defendant?

MR. ANDERSON: I am attempting to meet the statement of Dr. Stieglitz, and I am going to ask in a moment that we go into chambers and take the evidence, just as soon as I lead up to it.

MR. KRESEL: I have no objection to going into chambers.

MR. ANDERSON: But I want to lead up to it by showing that he has data from the public records of the United States and in his office that will justify me in asking the Court to go into chambers to take that evidence.

MR. KRESEL: I am perfectly willing to go.

THE COURT: You have made no application to that effect now. What is the question?

MR. ANDERSON: This question is whether he had collected data——

MR. KRESEL: I ask that it be read.

MR. ANDERSON: All right, read the question.

(Q. 39 read as recorded above.)

MR. KRESEL: My objection to it, your Honor, was, first, that it was hearsay, calling for the contents of reports by other people; second, that it is not proper rebuttal. If it is the purpose of the Government to rebut the testimony given by Dr. Stieglitz, that testimony was perfectly definite; it spoke of certain people whose deaths occurred, and it identified who they were. I do not deny that counsel have a right to do it if they can show the contrary, but for us now upon rebuttal to have presented here to the Court the result, if there be such result, of a general investigation made by this department, and to go into reports made to this witness by his subordinates upon the general subject of toxicity of salvarsan, is not a matter that we should embark upon in rebuttal.

THE COURT: Will you read the question again?

(Q. 39 again read as recorded above.)

THE COURT: In so far as the objection pertains to form, it is sustained. That makes it unnecessary at this time to rule upon the second ground.

Q. 40. Can you state whether the Public Health Service under your direction has any data as to deaths or reactions from the use of salvarsan or arsphenamine and its preparations?

MR. KRESEL: I will not object to that. It is an introductory question.

A. We have such data.

MR. ANDERSON: I will now move the Court to go into chambers and take that data, since under the ruling of the Court when Dr. Stieglitz was on the stand I do not think it is information that can be taken in open court.

MR. KRESEL: I have no objection to that, your Honor.

THE COURT: We will retire to chambers.

(Court, counsel and witness then retire to the chambers of the Court.)

AFTER RECESS.

MR. ANDERSON: I understand that the two exhibits which were introduced, being published reports, will go into the regular exhibit book. (Plaintiff's Exhibits 666 and 668.)

THE COURT: Yes.

MR. ANDERSON: If your Honor please, I now desire to introduce in connection with this matter certain correspondence signed by Dr. Steiglitz and counsel has agreed to admit the authenticity without recalling Dr. Steiglitz for the purpose of proving authenticity.

MR. KRESEL: I have agreed to do that.

MR. ANDERSON: Yes.

The first letter is a letter dated January 25, 1918, to Mr. H. A. Metz, signed Julius Steiglitz.

MR. KRESEL: It is immaterial, but I will not object to it. It takes more time to object than not to.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 669." (*See Exhibits, Vol. III, page 1721.*)

MR. ANDERSON: The next is a letter dated February 19, 1918, from Dr. Steiglitz to Mr. Metz.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 670." (*See Exhibits, Vol. III, page 1722.*)

MR. ANDERSON: I offer in evidence a letter dated February 25, 1918, from Dr. Steiglitz to Mr. Metz, as Plaintiff's Exhibit No. 671.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 671." (*See Exhibits, Vol. III, page 1723.*)

MR. ANDERSON: I offer in evidence a letter, March 7, 1918, from Dr. Steiglitz to Mr. Metz.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 672." (*See Exhibits, Vol. III, page 1724.*)

MR. ANDERSON: I offer a letter from William J. Gies, of Columbia University, to the Farbwerke Hoechst Company, dated April 30th, 1918, as Plaintiff's Exhibit No. 673.

MR. KRESEL: To which we object as hearsay.

THE COURT: Sustained, unless you show that it is not.

MR. ANDERSON: Of course I would have to call the witness to prove it, and as the objection is made on the ground of hearsay, I will have to eliminate it, of course.

I offer in evidence letter dated June 1st 1918, from Dr. Steiglitz to Mr. Metz, as Plaintiff's Exhibit No. 673.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 673." (*See Exhibits, Vol. III, page 1724.*)

MR. ANDERSON: I offer in evidence a letter dated August 15, 1918, from Dr. Steiglitz to Mr. Metz.

MR. KRESEL: No objection.

THE COURT: It is admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 674." (*See Exhibits, Vol. III, page 1725.*)

MR. ANDERSON: I offer in evidence——

MR. KRESEL: Pardon me a minute, Colonel Anderson. If you are not going to read the last letter, I would like to read it.

MR. ANDERSON: Very good.

MR. KRESEL: May I have it, please?

MR. ANDERSON: Yes.

MR. KRESEL: This is dated August 15, 1918. (Reading Plaintiff's Exhibit No. 674.)

MR. ANDERSON: I offer in evidence letter of March 27, 1919 from Dr. Steiglitz to Mr. Metz.

MR. KRESEL: No objection, although it is not proper rebuttal.

THE COURT: Admitted.

Received in evidence and marked "Plain-

tiff's Exhibit No. 675." (*See Exhibits, Vol. III, page 1727.*)

MR. ANDERSON: I offer in evidence letter dated April 10, 1919 from Dr. Steiglitz to Mr. Metz.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 676." (*See Exhibits, Vol. III, page 1729.*)

MR. ANDERSON: I offer in evidence letter dated May 2, 1919 from Dr. Steiglitz to Mr. Metz.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 677." (*See Exhibits, Vol. III, page 1730.*)

THE COURT: Colonel Anderson, how would it be to have a night session tonight and a short session tomorrow?

MR. ANDERSON: I think we might, if your Honor can stand it.

I offer in evidence a letter dated September 25, 1919 from Dr. Steiglitz to Mr. Metz.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 678." (*See Exhibits, Vol. III, page 1730.*)

By MR. ANDERSON:

Q. 41. Dr. McCoy, are you a chemist or a physician?

A. Physician.

Q. 42. Have you ever had any experience in dealing with the working out of formulae under patents?

A. No.

Q. 43. You have not?

A. Never.

Q. 44. Do you know anything of your own knowledge about the German patents on salvarsan, novocain, cinchophen, any of those patents?

A. No.

MR. KRESEL: What do you mean, whether he knows anything?

Q. 44. (Continuing) Anything of the chemical formulae or the operations in carrying out those formulae?

A. Nothing from the chemical side.

Q. 45. Can you identify the signature on that letter, Doctor (handing paper)?

A. Yes.

MR. ANDERSON: I offer in evidence original letter dated June 27, 1918, from Dr. McCoy, to Mr. Metz, which has just been identified by the witness.

MR. KRESEL: It is not proper rebuttal, but let it go in.

THE COURT: There is no objection?

MR. KRESEL: No objection.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 679." (*See Exhibits, Vol. III, page 1732.*)

MR. ANDERSON: I have not the original letter, but there is just a paragraph that I would like to read into the record. The letter is dated May 7, 1918, addressed to the Farbwerke-Hoechst Company, New York City, and signed by G. W. McCoy, director. It is printed in this book and counsel have agreed.

THE COURT: Counsel makes no objection?

MR. KRESEL: No objection, your Honor.

THE COURT: Admitted.

MR. ANDERSON: The letter reads as follows:

"Treasury Department,
United States Public Health Service.
Washington, May 7, 1918.

Farbwerke-Hoechst Co.,
New York City.

Dear Mr. Metz.

We have been interested in Dr. Lake's report of his visit to your laboratory. Apparently the only difference that seems likely to account for the differences in results of your testing and of our own lies in the fact that you starve your animals prior to inoculation. I think, all things considered, it would be better if you revise this practice and use animals kept under average or ordinary conditions as regards food. Our testing appears to check up very well with that of another commercial manufacturer, who has been using rats that have not been deprived of food for any considerable length of time. For the sake of uniformity I think it would be well if you brought the testing at your establishment in line with this.

With best regards, I remain,

Sincerely yours,

G. W. McCoy.
Director."

Q. 46. The animals you referred to, were the rats used in testing this drug, were they not?

A. I judge so.

MR. ANDERSON: That is all.

CROSS-EXAMINATION.

By MR. KRESEL:

XQ. 47. Dr. McCoy, though you are not a chemist, you know, do you not, that there were German patents covering salvarsan?

A. A matter of common understanding.

XQ. 48. Well, it came to your knowledge, in your official capacity?

A. Oh, yes.

XQ. 49. And you know, of course, that this suit is about those patents, do you not?

A. Just that.

XQ. 50. In the course of your official duties, you obtained knowledge as to the experience of American manufacturers trying to make arsphenamine according to the specifications of those German patents, did you not?

A. In a second-hand, indirect way, I did.

XQ. 51. I mean, whatever information you got, you got in your official capacity?

A. Yes.

XQ. 52. And you knew, did you not, that it took manufacturers at least 18 months before they could produce any arsphenamine?

A. That would not be a rule.

XQ. 53. I did not ask you whether it was a rule. You knew that that was the case?

A. In some instances.

XQ. 54. And you so testified before a Congressional Committee, did you not?

A. I testified that——

XQ. 55. Did you not so testify?

A. I testified that what I had to state was hearsay, and that hearsay——

XQ. 56. Now, just listen, Dr. McCoy. Did you not testify as follows——

MR. ANDERSON: You have got a right to have this book, if you want it, containing your testimony.

MR. KRESEL: Yes, he can have the book, certainly.

(Mr. Anderson hands book to witness.)

XQ. 56. (Continued.) Page 88, a little lower than the middle of the page, Dr. McCoy, speaking of the situation at the outbreak of the war, you said:

"Doctor McCoy. Yes. Then the British blockade soon cut off our supplies and one or two American manufacturers proceeded to manufacture it even prior to the United States going into the War, and in each case it was a matter of at least a year of blundering along in an experimental way before they did succeed in producing it, and there was a period prior to taking over the patents by the Government when a little was being produced by American manufacturers and supplied to the American medical profession."

That is true?

A. That is true, yes.

XQ. 57. By the way, Dr. McCoy, before you took the witness stand and in your conferences with the Government you called their attention to your testimony before this Congressional Committee, did you not?

A. Yes.

XQ. 58. You know, do you not, from your official information that the price of arsphenamine today is very much lower than it was before the war?

A. Yes, sir.

XQ. 59. Is it not a fact that arsphenamine today is being sold to the Government at 13 cents an ampule?

A. That is right.

XQ. 60. And before the war Metz was selling it at $2.50 an ampule wholesale; is that not the fact?

A. That is my understanding.

XQ. 61. And there is keen competition in the United States in the production of arsphenamine, is there not?

A. Unquestionably.

XQ. 62. And you so testified before this Congressional Committee, did you not?

A. I suppose I did. I don't remember that.

XQ. 63. I ask you whether you gave this testi-

mony before the Congressional Committee, talking about the German patents, at the top of page 91:

> "I have talked that matter with some of the most able chemists in the United States and they all say that the description in the patent is so sketchy and there is so much necessary that is omitted that a well-qualified chemist can not proceed and produce the material. He has to do a great deal of experimenting. I know one large well-equipped manufacturing house commanding the best chemical talent money can secure, that spent about eighteen months before they turned out the first commercial batch of salvarsan."

Did you so testify?

A. Yes.

XQ. 64. And that is true?

A. That is true.

XQ. 65. At page 90 of your testimony before this committee do you remember giving this testimony, questioned by Mr. Huddleston: "What was their difficulty in producing that product?" You were talking about salvarsan, were you not?

A. Yes, sir.

XQ. 66. And neosalvarsan?

A. Yes, sir.

XQ. 67. And your answer was:

> "The fact that they were not acquainted with the processes the Germans had used and the processes the French were using in preparing the material. It was an entirely new field.
>
> "MR. HUDDLESTON: Were not those processes described by the patents?
>
> "DR. MCCOY: The processes, as described by the patents, I am told—now, this is hearsay—are the very minimum required to secure the patent, and in no way adequate to enable even a competent chemist to reproduce the material.
>
> "MR. HUDDLESTON: So that the parties who

are now producing a satisfactory quality of this product are not proceeding by the formula as filed in the Patent Office, but are proceeding as their experience has taught them, having figured out in some way how to produce this substance?

"DR. MCCOY: Yes, that is a fair statement."

You so testified?

A. Yes.

XQ. 68. And that was true?

A. Yes, to the best of my knowledge.

XQ. 69. Certainly. Two more questions, Dr. McCoy. Your tester—I mean the man that makes the tests of batches of arsphenamine sent to you by manufacturers—is a Dr. Lake. Right?

A. No.

XQ. 70. Was a Dr. Lake?

A. Was.

XQ. 71. Until how long ago?

A. He has been off and on the tester for five or six years.

XQ. 72. And he was testing for you in 1918?

A. Probably.

XQ. 73. And in 1919?

A. He was away from the plant at some period for a year or a year and a half, but I don't know just when he was away from our place.

XQ. 74. With the exception then of a year or a year and a half, he was the tester of your Hygienic Laboratory?

A. No. Even when he is there, he is not the only tester who does testing.

XQ. 75. How many others have you doing testing?

A. We have had two others doing it routinely; and in the emergencies, in the absence of these men, someone else would take it over.

XQ. 76. And what are Dr. Lake's relations to Mr. Herman A. Metz?

A. So far as I know, there are none now except an acquaintance.

XQ. 77. Well, have there been?

A. He was at one time an employee of the Metz Laboratory.

XQ. 78. And when?

A. Approximately covering 1919, perhaps running into 1918 and off into 1920. But I have not the dates.

XQ. 79. When did you last hear from Mr. Metz?

A. I am unable to say. We have correspondence with him nearly every week.

XQ. 80. Well, I mean with reference to his testimony here.

A. I have never heard from Mr. Metz with reference to his testimony here.

XQ. 81. Perhaps you do not get my question. Have you not heard from Mr. Metz say within ten days about his testimony here and about what you might be called upon to state, by telephone?

A. No.

XQ. 82. You have had no communication with him?

A. With Mr. Metz?

XQ. 83. Yes.

A. No.

XQ. 84. Or anybody in his behalf?

A. No, if you would except the attorneys—if they could be construed as speaking in his behalf, two attorneys from the Department of Justice.

XQ. 85. No, I do not lay that sin at their door. Now, let us see, Doctor McCoy. I know you are trying to tell us the truth, but your recollection may not be quite so good. You have seen these publications in

the newspapers about Mr. Metz's testimony here about salvarsan?

A. Oh, they have been quoted to me but I have not seen them. I purposely avoided that.

XQ. 86. In connection with that, have you not had some communication with Mr. Metz, his agents or attorneys, about how his testimony might or might not be borne out by you and your records? Just think now.

A. No.

XQ. 87. Not at all?

A. No.

XQ. 88. Not within the past two or three weeks?

A. I have no recollection of anything of the sort. If you will give me the specific instance you have in mind, I will endeavor to identify it.

XQ. 89. Either by telephone or by letter?

A. No.

XQ. 90. None at all?

A. I recall none.

XQ. 91. Has nobody come to you, Dr. McCoy, to find out about what your records indicated as to the toxicity of Mr. Metz's product?

A. Well, no one save some newspaper men and some attorneys.

XQ. 92. I will omit the newspaper men, and if you mean the attorneys representing the Government here, I will omit them. Now, anybody else?

A. I can not recall any.

XQ. 93. Who were the attorneys that came to see you?

A. I do not know that he touched on this point, but Mr. Galloway came to see me. Am I right about that? And a Mr. Church. Am I right about that?

Mr. Anderson: I think so. Mr. Church is assistant to Mr. Knight in the Department of Jus-

tice. I suppose that is the gentleman to whom you refer.

MR. KRESEL: There is no question about that.

XQ. 94. Did any other lawyer come to see you?

A. No.

XQ. 95. Do you remember that you were asked to be a member of a committee on arsphenamine for the Chemical Foundation?

A. I believe I was. I was a member of a committee for the Federal Trade Commission.

XQ. 96. And later became a member of the committee for the Chemical Foundation?

A. I think I inherited the relation with the Chemical Foundation.

XQ. 97. And Dr. Stieglitz was on that committee?

A. I believe so.

XQ. 98. And who was the third party?

A. I do not know.

XQ. 99. Is it not a fact that the Chemical Foundation submits to you, as the official head of the Hygienic Laboratory, every application for license that is made to it on arsphenamine?

A. So far as I know, they do, yes.

XQ. 100. And there is now pending before you an application which has been submitted to you by the Chemical Foundation in that respect?

A. I do not recall.

MR. KRESEL: That is all.

RE-DIRECT EXAMINATION.

By MR. ANDERSON:

RDQ. 101. Dr. McCoy, you were called here by Mr. Knight, counsel for the Government in this case, were you not, to testify?

A. Yes.

RDQ. 102. And you asked that a subpoena be issued to bring you here, did you not?

A. No, I suggested that I would rather come with a subpoena than otherwise. So far as I know, none was issued.

RDQ. 103. You were asked to come without a subpoena on account of the delay required in issuing it?

A. I do not know that.

RDQ. 104. I will read to you the complete testimony on this subject, a part of which was read by counsel, from page 90 of the hearings on Alien Property before the Committee on Interstate and Foreign Commerce of the House of Representatives, on H. R. 13,496. That is what was commonly called the Winslow Committee?

A. That is my understanding.

RDQ. 105. You testified as follows:

"MR. HUDDLESTON: Doctor, you spoke of these first American manufacturers of salvarsan as having proceeded 'blunderingly'—why was that?

"DOCTOR MCCOY: Perhaps that was a poor word to use. They were embarking upon a field in which no American chemist had had previous experience.

"MR. HUDDLESTON: What was their difficulty in producing this product?"

MR. KRESEL: This part has already been read, unless you want to read it again.

MR. ANDERSON: I will put it all in together. It is just half a paragraph.

MR. KRESEL: I just wanted to call your attention to that fact.

MR. ANDERSON: (Reading)

"DOCTOR MCCOY. The fact that they were not acquainted with the processes the Germans had used, and the processes the French were using in

preparing the material. It was an entirely new field.

"MR. HUDDLESTON. Were not those processes described by the patents?

"DOCTOR MCCOY. The processes, as described by the patents, I am told—now, this is heresay—are the very minimum required to secure the patent, and in no way adequate to enable even a competent chemist to reproduce the material.

"MR. HUDDLESTON: So that the parties who are now producing a satisfactory quality of this product are not proceeding by the formula as filed in the Patent Office, but are proceeding as their experience has taught them, having figured out in some way how to produce this substance?

"DOCTOR MCCOY. Yes; that is a fair statement.

"MR. HUDDLESTON. If their activities should continue as at present, would that constitute a violation of this salvarsan patent?

"DOCTOR MCCOY. It is my understanding, sir, that the German patents cover both the process which the American manufacturer may or may not use and also the final product, which is the same final product regardless of the process used.

"MR. HUDDLESTON: Of course, I am not a patent lawyer and my ideas on the subject are rather vague, but I have in mind that an idea cannot be patented, or protected by a patent, and I am wondering how a substance may be protected by a patent so that no one else can make the substance when its manufacture does not depend upon any prescribed formula. I do not suppose you can enlighten me on that because it would take a patent lawyer to do it.

"DOCTOR MCCOY: No, sir."

Now, Dr. McCoy, were you speaking of your knowledge in that matter?

MR. KRESEL: What matter?

MR. ANDERSON: In the testimony which I have read.

A. No. That was information that came to me from conversations with producers and chemists.

RDQ. 106. And you stated at the time that it was hearsay, did you not?

A. In part.

MR. KRESEL: He stated as to one section that it was hearsay, and you read it.

RDQ. 107. Did you ever try to manufacture any of this stuff under this patent yourself?

A. No.

MR. KRESEL: He has already testified he did not.

RDQ. 108. Have you ever studied the German patent on this subject yourself?

A. No, sir.

MR. ANDERSON: That is all, doctor.

MR. KRESEL: That is all.

(Witness excused.)

MR. ANDERSON: I believe you want Dr. McCoy to produce certain records, those records from his office at Washington.

MR. KRESEL: Colonel, as I said in chambers, if that means that you cannot finish on account of that before Monday, I will waive that, but if we are to be here Monday, I would like to have it.

MR. ANDERSON: I think we can find out certainly in time for Dr. McCoy to know and get them here Monday, if we are detained that long. I will try not to, myself. So for the present, we will hold that in suspense.

MR. KRESEL: If you will.

MR. ANDERSON: I will call Mr. Christiansen.

WALTER G. CHRISTIANSEN.

WALTER G. CHRISTIANSEN was called as a witness on behalf of the plaintiff, in rebuttal, and being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. ANDERSON:

Q. 1. Please state your name and place of residence?

A. Walter G. Christiansen; residence, West Somerville, Massachusetts.

Q. 2. What is your profession?

A. I am a chemist.

Q. 3. Please state your education and experience as a chemist.

A. I graduated from Harvard in 1918 with the degree of Bachelor of Science. During my senior year I did some teaching in organic chemistry and later worked as control chemist in one of the duPont laboratories. Subsequent to that I was for one year——

MR. KRESEL: Give the year, please.

A. (Continuing.) ——from late in 1918 until 1919 in the Eastman Kodak Laboratories in Rochester, New York, as a research chemist. Since that time I have been at the Harvard Medical School doing research work on arsenicals.

Q. 4. On arsenicals?

A. Yes.

Q. 5. You are in the Laboratory of the Harvard Medical School?

A. I am.

Q. 6. As a chemist?

A. Yes.

Q. 7. Mr. Christiansen, in the laboratory of the Harvard Medical School have you ever had occasion to try to make arsphenamine or salvarsan?

A. Many times.

Q. 8. In what year?

A. My first experiment was in December, 1919.

Q. 9. How many experiments did you make in this regard?

A. I have made about 1200 experiments in all.

Q. 10. Are you familiar with the so-called German Salvarsan patent of Dr. Ehrlich?

A. Yes.

Q. 11. Pending the production of the exhibit, I will go ahead, if there is no objection. How did you come to make an effort to produce salvarsan?

MR. KRESEL: Just what is meant by that?

MR. ANDERSON: I mean what occasioned his effort to produce salvarsan.

MR. KRESEL: I object to that as immaterial.

MR. ANDERSON: If you object, I withdraw the question. It is merely to show that he was not making it——

MR. KRESEL: Very well.

Q. 12. Mr. Christiansen, please tell the Court whether in your first experiments with salvarsan, you undertook to follow the Ehrlich patent.

MR. KRESEL: One minute, please.

MR. ANDERSON: All right, I will get the patent, that is the quickest way. I cannot ask him what he did under the patent unless I give it to him.

Q. 13. I hand you Defendant's Exhibit No. 156, Patent No. 986,148, patented March 7, 1911, and ask if you are familiar with that patent (handing witness)?

A. That is the patent which I followed.

MR. KRESEL: I ask that that answer be stricken out.

THE COURT: Strike out the answer.

Q. 14. I asked are you familiar with it.

A. I am.

MR. ANDERSON: He says "I am." I asked the question over.

Q. 15. Now, I will ask you to take that patent and tell the Court exactly what you did and what was the result. You can read the patent if you want to.

MR. KRESEL: There is no necessity for reading it.

MR. ANDERSON: He is not an experienced witness, and I told him because I thought he might think it was necessary for him to memorize it.

A. I followed the directions of this patent, using the quantities of materials stated and technique which I thought should be employed in this process and I obtained the reaction designated, and secured a product which conformed to all the standards of the public health service, and the toxicity was less than that specified by the Public Health Service.

Q. 16. I will ask you, did you test the product chemically?

A. I did.

Q. 17. What test did you follow?

MR. KRESEL: "What test did you make"—you mean?

Q. 17. (Continued.) What test did you make?

A. I analyzed it to determine the arsenic content and ran some qualitative tests to determine the chemical properties of the material.

Q. 18. Were those tests matters of common knowledge to those skilled in the art of chemistry?

A. They are.

MR. KRESEL: Wait a minute. I object to that and ask that it be stricken out. He should give what tests he made.

MR. ANDERSON: He as a chemist is certainly capable of saying what is a matter of common knowledge to those skilled in the art of chemistry.

MR. KRESEL: On the contrary, witnesses called for the defense were, under objection by counsel, not permitted to state that.

MR. ANDERSON: I never objected to a chemist's saying whether a thing was something that a man skilled in the art would know.

MR. KRESEL: If you reflect, I think you will agree that you made such objections.

THE COURT: Will you read the question?

(Q. 18 repeated as above recorded.)

THE COURT: I think that the question is too general and that the difficulty will continue so long as the question is general; but you can get your answer, I take it, by putting another question. I will sustain the objection.

Q. 19. I will ask you to state again just what the first process of chemical testing of this material was.

A. I analyzed it first to determine the arsenic content of the material.

Q. 20. Was that an ordinary laboratory test?

A. Yes.

Q. 21. I will ask you to take the next step which you took in testing it chemically.

A. In a pamphlet written by Dr.——

MR. KRESEL: I object to that. That is not answering the question.

Q. 22. All right; just tell me the next step you took.

THE COURT: In answering the questions, bear in mind the specific question, and give as direct an answer to it as you can without explanations, and if you need to modify your affirmative or negative answers, you may do that.

A. I determined the solubility of the material in water——

MR. KRESEL: I object to that. That gives the conculsion and not the step.

Q. 23. What was the chemical step that you took?

A. I added the material to water and obtained the characteristic yellow solution. To that I added caustic soda, which precipitates arsphenamine base and subsequently redissolves it to a characteristic yellow solution, from which the base can be precipitated by the addition of acetic acid. In another case, in which I dissolved the solid in water I added a reagent which is used in testing for amino groups and got a positive reaction, as I should, and confirmed that by adding a second reagent used for the same purpose.

Q. 24. Is it a fact or not that all of these tests were the chemical tests that you applied to ascertain the character and quality of the products?

MR. KRESEL: I object to that as leading. That is the whole subject.

MR. ANDERSON: I withdraw the question.

Q. 25. You say you followed directly the details formally stated in that patent?

A. I did.

Q. 26. What did you get?

A. I got a yellow product which dissolved, which had all the characteristics of arsphenamine.

Q. 27. I will ask you whether you made the tests on animals of that product in your first experiment.

A. That material was tested on animals——

MR. KRESEL: Wait a minute, that is not the question. The question is whether you made the test of that particular material on animals.

THE WITNESS: I did not.

MR. KRESEL: That is the answer.

Q. 28. Was it tested by your assistants in the laboratory on animals?

MR. KRESEL: I object to that unless the witness was there and saw it done.

THE WITNESS: I was.

MR. KRESEL: That is an answer.

Q. 29. You were there?

A. Yes.

Q. 30. What was the result? I will ask you this: What test did you apply to the animal, and what animal did you use?

A. It was tested by intravenous injection into white rats.

Q. 31. On what scale or basis of tests?

A. It was injected on a basis of 120 milligrams per kilo and 130 milligrams per kilo.

Q. 32. What result did you get at 120 milligrams to the kilo?

MR. KRESEL: If he knows anything about it personally.

Q. 33. I am now assuming, as you said, that you were there and saw the tests made.

A. I was.

MR. KRESEL: But he does not say that he saw the result immediately, does he?

Q. 34. Did you see the results?

A. I did.

Q. 35. Did you follow through and watch the results?

A. I did.

Q. 36. What result did you get?

A. The majority of the animals injected with 120 milligrams per kilo survived.

Q. 37. When was this test made?

A. December, 1919.

Q. 38. Do you know of your own knowledge what was then the standard test of the Public Health Service of the United States?

MR. KRESEL: I object to that as immaterial.

THE COURT: Sustained.

Q. 37. Was that the first experiment you had made in this thing?

A. That was the first batch of arsphenamine I had made.

Mr. Kresel: I ask that that be stricken out as not responsive. The question was, was that the first experiment he had made.

The Witness: It was.

Q. 40. It was the first experiment you made, in making arsphenamine?

A. Yes.

Q. 41. I will ask you if you made any more experiments.

A. I did.

Q. 42. Speaking now of the formula under that patent?

A. I did.

Q. 43. What did you get?

Mr. Kresel: When, please?

Q. 44. When?

A. These experiments were made immediately after the first experiment.

Mr. Kresel: That does not give us the date.

The Witness: In December, 1919.

Q. 45. Did you make a series of experiments in this work?

A. I did.

Q. 46. How long did they continue?

A. They have continued for several years.

Q. 47. Did you undertake to vary the process in any respect after the first experiment?

Mr. Kresel: I object to that as leading. Your Honor will recall I was kept strictly to asking my experts: "What did you do, what result did you obtain?"

The Court: Yes, the objection is sustained.

Mr. Anderson: I can take 1200 experiments and ask him what he did every time, if you want me to.

MR. KRESEL: I do not care what you take; it is not any of my business, Colonel.

Q. 48. Take the next of the 1200 and tell me what you did the second time, if you recall it.

A. In the second experiment I tried to duplicate the first one to obtain a check result.

Q. 49. What result did you get?

A. The product was tolerated in a dose slightly lower than that of the first, but approximately—

MR. KRESEL: What was that, Doctor, I did not understand?

THE WITNESS: The product was tolerated in doses slightly lower than that of the first sample.

MR. KRESEL: What do you mean by tolerated?

THE WITNESS: The animals survived after they received an injection.

THE COURT: Shall we let him finish the answer?

MR. KRESEL: Yes, sir.

A. (Continued) When the product from the second experiment was tested on the animals they would not stand 120 milligrams per kilo, but did survive when treated with 100 milligrams per kilo.

Q. 50. What process did you follow in making the second experiment; state what you did, I mean.

A. In the second experiment I followed the patent, as in the first experiment.

Q. 51. And the result which you got was what you have stated?

A. Yes.

Q. 52. Did you make a third experiment?

A. I did.

THE COURT: What was the net result in mortality of white rats in the second experiment, or what percentage died in the second experiment, or survived?

THE WITNESS: Except as a tolerated dose, that dose at which the majority of the animals survived, sixty per cent.

THE COURT: My inquiry was what percentage of the animals treated with the product of your second experiment survived?

THE WITNESS: I do not remember exactly.

Q. 53. How about the third experiment, Mr. Christiansen?

MR. KRESEL: And please state when it was made.

A. This was made in the last part of December, 1919. I cannot remember definitely the result of the third experiment.

Q. 54. Did you continue to experiment under this patent?

A. I did.

Q. 55. You said you made 1200 separate tests under it?

A. I had.

MR. KRESEL: 1200 experiments, I understand, and not tests. Which was it?

MR. ANDERSON: Or 1200 experiments.

THE WITNESS: 1200 experiments.

MR. KRESEL: That is what I thought.

Q. 56. What did you get in each of these 1200 experiments?

A. I have obtained very variable results.

MR. KRESEL: I ask that that be stricken out.

THE COURT: Motion granted.

Q. 57. Did you in any of the experiments you have mentioned, when following the process outlined in the patent, which you have described, fail to get salvarsan or arsphenamine?

MR. KRESEL: I object to that as leading.

THE COURT: Sustained.

Q. 58. Can you state what product, chemical or pharmaceutical product, you secured in each of the experiments you have mentioned in which you followed the process stated in the patent, which you have described?

THE COURT: Your answer is yes or no, can you state?

A. Yes.

Q. 59. What product did you get?

A. I obtained arsphenamine.

Q. 60. Did you test chemically and with animals for purity in those cases?

MR. KRESEL: In every case; is that the question?

MR. ANDERSON: Yes, in every case, and if not, in how many cases?

MR. KRESEL: As to each of the 1200.

A. No.

Q. 61. In how many cases did you test?

A. In at least 80 per cent. of the cases.

Q. 62. Can you state the results where you made tests?

MR. KRESEL: In each case, please.

A. I cannot remember all the results.

Q. 63. You cannot state the results in each case? Very well, I won't press the question.

THE COURT: Can he state the maximum and minimum result obtained?

Q. 64. You have heard the Court's suggestion. Can you state the maximum and minimum result of purity where you followed the formula in the patent? I am talking about that now.

A. I can.

Q. 65. All right, state it.

A. The maximum tolerated dose obtained was 130

milligrams per kilo and the lowest 80 milligrams per kilo.

MR. ANDERSON: The witness is with you, gentlemen.

CROSS-EXAMINATION.

By MR. KRESEL:

XQ. 66. If you do not mind I will call you Dr. Christiansen.

A. Very well.

XQ. 67. We are so used to calling chemists doctors here that I get confused. You graduated in 1918?

A. I did.

XQ. 68. And you took a degree of B. S.?

A. I did.

XQ. 69. Is that the only degree you hold?

A. Yes.

XQ. 70. And I assume that you were graduated in the summer of 1918?

A. In June.

XQ. 71. Then you went to work for what concern?

A. For the du Pont Company.

XQ. 72. How soon after your graduation did you go to the duPont Company?

A. Immediately.

XQ. 73. How long did you stay with the duPont Company?

A. I was with them until September 1, 1918.

XQ. 74. So that you were with them three months?

A. I was.

XQ. 75. A little less than that?

A. A little less than three months.

XQ. 76. And what work did you do while with the duPont Company—just the character of work?

A. It was control work on plant production.

XQ. 77. That is Greek to me. What does that mean?

A. That is the determination of the quality of products produced in the plant, in order to prove that the process was being properly carried out.

XQ. 78. Was that in the dye works or the explosive works, or which?

A. It was in the smokeless powder division.

XQ. 79. So for three months immediately following your graduation you were testing smokeless powder to see whether it was manufactured according to formula?

A. I was testing the diphenylamine used in the smokeless powder.

XQ. 80. The intermediate?

A. Yes.

XQ. 81. Then you left. Where did you go then?

A. I was in the research laboratory of the Eastman Kodak Company.

XQ. 82. Did you go there immediately on the 1st of September?

A. I did.

XQ. 83. And how long were you with the Eastman Kodak Company?

A. Exactly one year.

XQ. 84. You say you were in the research laboratory. What was the nature of your work there?

A. It was the development in the laboratory of processes for the manufacture of photographic developers and the transferring of these processes into the plant.

XQ. 85. The Eastman Kodak Company manufactures photographic supplies?

A. It does.

XQ. 86. And all your work there for that year was work connected with the manufacture and supply of photographic material?

A. It was.

XQ. 87. That brings us to September, 1919.

A. It does.

XQ. 88. And during the period between June, 1918, when you were graduated, and September, 1919, your time was occupied, and I assume entirely occupied, with your duties with the duPont Company and the Eastman Kodak Company?

A. Not wholly.

XQ. 89. You mean you worked at night?

A. Sometimes. During the latter part of the summer of 1919.

XQ. 90. The summer of 1919 you worked at night?

A. Yes.

XQ. 91. And what kind of work did you do then?

A. I was getting the literature together, preparing to do my work on arsphenamine.

XQ. 92. You were just collecting literature?

A. Yes.

XQ. 93. Then after leaving the Eastman Kodak Company you went back to Harvard?

A. To the Harvard Medical School.

XQ. 94. And where is that located?

A. In Boston.

XQ. 95. And you have been there ever since?

A. I have.

XQ. 96. That is a period of three years or so—a little over three years.

A. It will be four in September.

XQ. 97. What are you there—on the teaching staff?

A. I am an instructor in pharmacology.

XQ. 98. How long have you been an instructor in pharmacology, ever since you went back?

A. I have.

XQ. 99. September, 1919?

A. Yes.

XQ. 100. You lecture to classes in pharmacology?

A. I do not lecture. I hold that position without doing any teaching.

XQ. 101. You have done no teaching at all?

A. No.

XQ. 102. Have you done any writing?

A. Considerable.

XQ. 103. Writing on subjects that you investigate?

A. Yes.

XQ. 104. Under whose direction do you work?

A. Dr. Reed Hunt.

XQ. 105. And is he a chemist?

A. He is not.

XQ. 106. What is he, a physician?

A. He is.

XY. 107. In what department are you in Harvard University—or rather Harvard Medical School?

A. In the Department of Pharmacology.

XQ. 108. And who is the head of that?

A. Dr. Reed Hunt.

XQ. 109. Did you make the experiments that you have described here under Dr. Hunt's supervision?

A. He was there, but he gave no active supervision to the work.

XQ.110. I did not mean whether he took part therein, but what I mean is this: Did you prosecute this research upon your own inclination or was it a part of your duty?

A. It was part of my duty.

XQ. 111. And it is in that sense that I meant it, that what you were doing you were doing under Dr. Hunt's supervision and instructions, I assume.

A. He gives me no instructions as to what I shall do or how I shall do it.

XQ. 112. Do you not receive instructions as to the subject that you are to investigate?

A. Only that.

XQ. 113. Then I understand that beginning with September, 1919, under instructions from your superior, Dr. Hunt, you undertook an investigation or research work in arsphenamine?

A. Yes, sir.

XQ. 114. Now we have it, and you then prosecuted that work during the whole time since September 1, 1919?

A. A majority of the time.

XQ. 115. What other work have you been performing?

A. A research on allied arsenicals.

XQ. 116. What allied arsenicals do you mean?

A. Derivatives of arsphenamine and compounds which are not derived from arsphenamine but which are very closely related to it.

XQ. 117. All of them, however, having arsenic as a base?

A. Yes.

XQ. 118. About how much of your time have you been devoting to arsphenamines?

A. 85 per cent. of my time, anyway.

XQ. 119. That is 85 per cent. out of what you had left after doing your writing, as I understand, which is quite considerable?

A. 85 per cent. of my laboratory time.

XQ. 120. And of your entire time how much did you spend in your laboratory?

A. Well, I average about 70 hours a week in my laboratory.

XQ. 121. Dr. Christiansen, how did you come to be a witness in this case?

A. Mr. Wright came to see me at my laboratory in Boston.

XQ. 122. Mr. Wright, of the Department of Justice?

A. Yes.

XQ. 123. Had you known Mr. Wright before?

A. I had not.

XQ. 124. Had you had any relation with the Department of Justice before this?

A. I had not.

XQ. 125. Is Dr. Reed Hunt in the country?

A. He is not.

XQ. 126. Are there other chemists in the Department of Pharmacology of the Harvard Medical School?

A. My assistants.

XQ. 127. Next to Dr. Reed Hunt you are in charge?

A. Dr. Hale is in charge, but he is on his vacation.

XQ. 128. Is he a chemist?

A. He is not.

XQ. 129. I do not mean to be in any way reflecting upon you, Doctor, but I assume that you are being compensated for your work here?

A. I have obtained nothing for my work.

XQ. 130. You expect to?

A. I was told that my traveling expenses would be paid.

XQ. 131. Is that all?

A. And for my professional services.

XQ. 132. Has that sum been agreed upon?

A. It has not.

XQ. 133. The first experiment that you made on salvarsan—we call it salvarsan here; sometimes arsphenamine, usually salvarsan—was made by you in December, 1919, I understand?

A. It was.

XQ. 134. Prior thereto you had made no experiments with that drug?

A. I had not.

XQ. 135. And the result of your very first experiment was, as you have testified, that you obtained salvarsan which at 120 milligrams gave you a result of survival of a majority of the rats that were infected?

A. Yes.

XQ. 136. You know, do you not, Doctor, that a 120-milligram test is higher than the test required by the United States Health Service?

A. I do.

XQ. 137. Their test today is 100?

A. It is.

XQ. 138. So that your very first experiment gave you the product 20 degrees better than the United States Public Health Service even today requires?

A. It did.

XQ. 139. And you obtained that result, I understand you to say, by strictly following the steps described in this salvarsan patent that you have before you?

A. I did.

XQ. 140. Well, of course, you realized that that was a splendid result, did you not?

A. So I have been told.

XQ. 141. Well, didn't you know then?

A. I thought it was very good.

XQ. 142. Well, you knew enough about the subject to know that if you get a product testing 120 degrees, you got the very best product that anybody ever obtained?

A. Not the very best product anybody has ever obtained.

XQ. 143. Except yourself. You obtained later 130?

A. Not except myself either.

XQ. 144. You obtained later 130?

MR. KNIGHT: You do not mean 120 degrees, do you?

XQ. 145. 120 milligrams. You understand?

A. I understand.

XQ. 146. Having gotten that very good result, you were not satisfied with that?

A. No.

XQ. 147. And you proceeded to make another experiment?

A. I did.

XQ. 148. Immediately?

A. I did.

XQ. 149. And what was the result of that second experiment?

A. The result of the second experiment was a yellow powder having all the characteristics of arsphenamine and tolerated at 100 milligrams per kilo of rat.

XQ. 150. In other words it was not quite as good as the result that you obtained in your first experiment?

A. No.

XQ. 151. Well, that somewhat discouraged you, did it not?

A. No, because I had expected that.

XQ. 152. It did not discourage you, very well. And the result of the second experiment you obtained, as I understand, by doing exactly the same things that you had done in your first experiment?

A. To the best of my knowledge.

XQ. 153. Well, the best that you could do?

A. Yes.

XQ. 154. Then not being satisfied with the result of the second experiment, you made a third one?

A. I did.

XQ. 155. Right away?

A. Well, within a day or two.

XQ. 156. And at that time, you again followed exactly the steps laid down in the patent?

A. I did.

XQ. 157. What result did you then obtain?

A. I said that I could not remember the exact results of my third experiment.

XQ. 158. Can you remember whether it was as good as your first?

A. I cannot.

XQ. 159. Cannot even remember that. Or as good as your second?

A. I cannot.

XQ. 160. At all events, it could not have been very satisfactory, because you proceeded to experiment, did you not?

A. I would have proceeded, anyway.

XQ. 161. Well, you did proceed?

A. I proceeded to experiment.

XQ. 162. And after that third one, you made 1197 more experiments, did you?

A. I did.

MR. ANDERSON: If your Honor please, the witness should be told that if Mr. Kresel interjects into his questions the argument that it could not have been satisfactory, while he must answer the questions yes or no, whether he experimented, he can explain, so that his answer will not be an implied admission it was not satisfactory.

THE COURT: Did you understand that from my remarks a few moments ago or not? Anyway, whether you did then or not, when you give an affirmative or negative answer, you may modify it or explain it, if it needs modification.

XQ. 163. How much of a yield did you obtain in your first experiment? Do you know what I mean by "yield"?

A. You mean the weight of material I obtained, considering the amount I started with?

XQ. 164. Yes, that is right.

A. Oh, I obtained a very good yield, which I should think was approximately 90 per cent. of the theoretical yield.

XQ. 165. In other words, if you were advising some corporation that desired to go into the business of manufacturing arsphenamine upon the result obtained by you in your first experiment, you would have no hesitancy in advising that they could go on and manufacture commercially?

A. Yes.

XQ. 166. By weight, how much did you get on that first experiment?

A. Approximately half an ounce.

XQ. 167. And is that approximately the amount that you obtained in each of your 1200 experiments?

A. It is not.

XQ. 168. Did you in the others obtain less or more?

A. Subsequently I worked with smaller quantities, as a rule. I obtained less.

XQ. 169. What would you say would be the average of your yield in your subsequent experiments?

A. My percentage yield remained approximately the same.

XQ. 170. About 90 per cent.?

A. Yes.

XQ. 171. But the weight?

A. The weight averaged only 1½ grams.

XQ. 172. In your 1200 experiments, how much arsphenamine did you produce?

A. I produced approximately 1500 grams.

XQ. 173. What did you do with it?

A. Most of it has been used up in analytical work

and pharmacological work, and the rest of it is in my laboratory.

XQ. 174. None of it ever sold?

A. No.

XQ. 175. Or used on human beings?

A. No.

XQ. 176. Of course, you keep records of your experiments?

A. I do.

XQ. 177. You have them with you?

A. I have.

XQ. 178. Will you produce them?

A. They are at the hotel.

MR. KRESEL: Your Honor, how long are we going to sit today, because I am willing to sit, as your Honor indicated this morning, until midnight.

THE COURT: We will not sit tonight unless by so doing we can get through tomorrow. If we cannot get through tomorrow, we will have our regular session tomorrow morning and then have no more activities until the following week.

XQ. 179. You will produce your records in the morning, will you?

A. I will.

XQ. 180. And are those the records of your 1200 experiments?

A. They are.

XQ. 181. You have a record as to the result of each experiment?

A. I have.

XQ. 182. Made by you personally?

A. Everything except the pharmacological testing was done by me.

XQ. 183. You mean the testing on the animals?

A. I do.

XQ. 184. That is, that testing was done by somebody else?

A. It was.

MR. ANDERSON: He stated it was done in his presence.

XQ. 185. And the record was made by you at the time you performed the experiments?

A. It was.

XQ. 186. You will produce that in the morning, will you?

A. Yes.

XQ. 187. How long did it take you to make your first experiment?

A. From the time I secured my last intermediate, it took me three or four days.

XQ. 188. How long did it take you to produce or obtain your last intermediate?

A. Three months.

XQ. 189. That is, you made it yourself?

A. I did.

XQ. 190. And I assume you then made enough to carry you for your 1200 experiments?

A. I did not, at one time.

XQ. 191. You made the intermediate for each experiment separately?

A. I have not.

XQ. 192. Where did you get the intermediate for the subsequent 1199 experiments?

A. We made them all, but we did not make them separately.

XQ. 193. I do not think I quite understand you. You say the first time that you made an intermediate you made only enough for one experiment, is that right?

A. I did not say I made enough for only one experiment.

XQ. 194. I understood you that way.

A. I said I did not make enough for all my experiments.

XQ. 195. How many times did you have to make intermediates?

A. My assistant has made intermediates many times; I do not know how many.

XQ. 196. You did not make the intermediate except the first time?

A. Not every time. I have made several sets of intermediates.

XQ. 197. Doctor, is it not a fact that it takes about a week to synthetically produce arsphenamine?

A. Do you mean starting from the last intermediate?

XQ. 198. I mean starting from the point at which you have got to start to make arsphenamine.

A. From the very beginning, it takes us more than a week.

XQ. 199. How long?

A. It would take at least two weeks to obtain the finished arsphenamine.

XQ. 200. Have you ever had any experience with arsphenamine applied to human beings?

A. I have not.

XQ. 201. Prior to your return to Harvard University in September, 1919, had you had any experience in making salvarsan?

A. I had not.

XQ. 202. Doctor, I do not want to put you in any light in which you ought not to be, and therefore I want to ask a question again to see if I understand you: My understanding of your testimony is that the very first time that you made any experiment in synthetically producing salvarsan, you obtained salvarsan which was tested at 120 milligrams, and you obtained a 90 per cent. yield of the theoretical yield?

A. I did.

XQ. 203. And that you obtained that result simply by strictly following the steps or specifications prescribed in the patent that you now have before you?

A. I did.

XQ. 204. May I have it, please? (Witness hands patent.)

XQ. 205. Doctor, what is the first step prescribed in this patent?

MR. ANDERSON: You have a right to have the patent before you if you wish.

MR. KRESEL: No, I am going to test his knowledge without the patent before him. He has made 1200 experiments, each time following this. Now I want to see what he knows about it.

MR. ANDERSON: I submit, if your Honor please, that in an examination on any instrument of that kind the witness is entitled to have the patent before him. I do not know whether he can remember it or cannot remember it; but this is not a memory test; this is a question of knowledge.

THE COURT: If I understand it, Mr. Kresel, we are not concerned with the terms of the patent, save as we can get them by referring thereto. What I assume we might be interested in are the precise steps which he took in the first experiment, if you want that; but I think that he can refer to the patent.

MR. KRESEL: That is what I am asking him.

XQ. 206. What was the first step that you took in your first experiment? What did you first do?

MR. ANDERSON: I respectfully suggest that he is entitled to have the patent before him to refresh his memory as to terms.

MR. KRESEL: If the witness states that he cannot answer without reading from the patent, then we will cross that bridge by letting him read from the patent.

By THE COURT:

Q. 206a. Do you want the patent to refresh your recollection?

A. Not immediately.

MR. KRESEL: I think that disposes of the objection for the present.

MR. ANDERSON: I only wanted to tell him that. Go ahead.

By MR. KRESEL:

XQ. 207. What was the first step that you took?

A. I dissolved a definite amount—I cannot remember the figures—of the sodium salt of para-hydroxyphenylarsinic acid in concentrated suphuric acid and cooling and keeping the temperature below zero degrees, added a mixture of nitric and sulphuric acids slowly and with continuous stirring of the solution in sulphuric acid.

After all the nitric acid had been added, I allowed the temperature to rise to 10 degrees, and then poured the sulphuric acid solution into a large volume of water in order to precipitate the nitration product.

This was then allowed to stand in order that the nitrohydroxyphenylarsenic acid might separate from the solution. This was filtered and washed and dried. That gives the final intermediate necessary to make arsphenamine.

This nitrohydroxyphenylarsenic acid is dissolved in water, containing a definite amount of caustic soda which is sufficient to give——

XQ. 308. How much caustic soda?

A. I was just going to say, sufficient to give a disodium salt of this acid.

XQ. 309. Well, how much?

A. I cannot remember the figures.

XQ. 310. Go on.

A. And this solution is then added to a solution of sodium hydrosulphite magnesium chlorid in water

and the combined solutions are digested at 50 degrees for a sufficient length of time to get complete reaction. During this process——

XQ. 311. What does that give you? After you digest it, what do you get?

A. During the digestion, arsphenamine base or diaminodihydrooxyarsenobenzene separates from the solution as a yellow powder, which the patent says is a microcrystalline. This arsphenamine base, as we call it, is removed from the reaction mixture and dried *in vacuo*. This product is then converted into dihydrochlorid. That is the process for making arsphenamine.

XQ. 312. And is the last the arsphenamine?

A. Arsphenamine is the dihydrochlorid of the product which separates from the digesting. The first product is arsphenamine base.

XQ. 313. Now, have you finished the process?

A. The patent, I think, gives some characteristics of arsphenamine and also refers to the production of some tetroamenohydrooxyarsenobenzenes and some diamenoarsenocresols; but those substances, although related to arsphenamine, have very little bearing upon the arsphenamine itself.

XQ. 314. Have you now described fully, as far as your recollection will serve you, the steps that you took in your first experiment that gave you the result you have described?

A. I have.

XQ. 315. The intermediate that you used, you say you did not have to make every time you made an experiment?

A. I did not have to make it every time.

XQ. 316. Is that readily available? I mean, could anybody go into a drug store, and if he knew the name of it, buy some of it?

A. He could not.

XQ. 317. Have you some available?

A. I have.

XQ. 318. At the present time?

A. I have.

XQ. 319. That you made yourself?

A. That my assistant has made.

XQ. 320. And how long would it take you, using that intermediate, to make arsphenamine?

A. It would take me three days.

XQ. 321. And I assume that was the length of time you consumed in each of your 1200 experiments, even assuming that you each time started with an already prepared intermediate?

A. In these 1200 experiments, there are numerous experiments recorded on the final product. I mean, I made 1200 experiments on arsphenamine and some of those experiments recorded processes to which I subjected the arsphenamine. I do not mean that I made arsphenamine 1200 times.

XQ. 322. That is what I thought. My understanding is—if I am wrong, you will correct me.

MR. ANDERSON: Let him finish.

MR. KRESEL: Wait a minute. I will put my question.

MR. ANDERSON: I object. He was in the midst of an answer and I insist he should be allowed to finish it. He was asked about it. He is entitled to finish his answer.

MR. KRESEL: The witness was not in the middle of an answer.

MR. ANDERSON: Will the stenographer read where he stopped?

(Answer to XQ. 321 repeated as recorded above.)

MR. ANDERSON: Had you finished your answer?

THE WITNESS: I had not.

MR. ANDERSON: I thought he was about to say something.

XQ. 323. What were you about to say?

A. I was about to say that in these 1200 experiments I have recorded as experiments the processes to which I subjected the final arsphenamine.

XQ. 324. My understanding of your testimony is that you made 1200 experiments and that as a result of each experiment you made arsphenamine? Is that correct?

A. The impression that I want——

XQ. 325. Is that correct, yes or no?

A. It is not.

XQ. 326. In what respect is it not correct? Or rather, I will put it this way: How many experiments did you perform as a result of which you obtained arsphenamine?

A. I cannot state what per cent. of these 1200 experiments we ran in order to prepare arsphenamine itself.

XQ. 327. I did not ask you for the percentage. I asked you for the number.

A. If I knew the percentage, I could state the number. I do not know the number.

XQ. 328. Then it is not a fact that you have made arsphenamine 1200 times?

A. I have not made 1200 separate batches of arsphenamine.

XQ. 329. You gave us a total of 1500 grams that you had produced. Was that not upon the basis of a production 1200 times?

A. It was an estimate of what I think my total production of arsphenamine has been.

XQ. 330. How could you give me an estimate if you do not know how many times you produced it?

A. Well, I know—I know the approximate amount I have made in the laboratory.

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XQ. 331. Well, how many times, can you say now; your best approximate information or knowledge or recollection as to how many times you have made arsphenamine?

A. Well, this will be approximate, but I should say there were 600 different productions of arsphenamine.

XQ. 332. We will take 600 then. At all events, your own records which you have here will show that exactly, will they not?

A. They will.

XQ. 333. In 1919, do you know whether the American market was getting all the arsphenamine that was required?

A. I have no knowledge of that.

XQ. 334. You did not undertake to make any commercial use of your ability to produce arsphenamine with such wonderful yields and results as you have described?

A. I could not.

XQ. 335. Had you done any reading on arsphenamine?

A. I had.

XQ. 336. What literature had you read?

A. I read a paper by Ehrlich and Bertheim in the *Berichter* of the German Chemical Society.

XQ. 337. Pardon me a minute. That is well known to you, but not to us. Where will we find that?

A. In any chemical laboratory.

XQ. 338. Which gives me no information. I mean, is it printed in any book or magazine that you can give me the name of?

A. I gave you the name of the book; the "Berichter of the German Chemical Society" is a bound series of books containing the reports of German chemists.

XQ. 339. And for what year was this publication that you speak of?

A. In the "Berichter" of 1912, I think.

XQ. 340. And you read an article by Ehrlich written in 1912?

A. I did.

XQ. 341. Of course, that was a publication that was open to anybody?

A. It was.

XQ. 342. Very well. Now, what other literature did you read?

A. Dr. Kober has published a paper in the *Journal of the American Chemical Society* on the production of arsphenamine.

XQ. 343. And what year was that?

A. I cannot state the year. It was in, I think, 1918.

XQ. 344. You know, do you not, that this Dr. Kober was of the Dermatological Laboratories?

A. I do not know that he was of the Dermatological Laboratories.

XQ. 345. What is his first name?

A. Philip, I think.

XQ. 346. Well, you do not know now where he hailed from; or do you?

A. The last I heard of Dr. Kober, he had a plant at Hastings-on-the-Hudson, New York.

XQ. 347. But at the time you read his paper in 1918?

A. I do not know where he sent that paper from.

XQ. 348. Do you know where he was doing his work?

A. I do not.

XQ. 349.What else did you read?

THE COURT: Will you fix the time for this reading?

XQ. 350. 1918, did you say, Doctor?

A. I think the papers were published in 1918.

XQ. 351. When did you read it, though?

A. I read it in the fall of 1919.

XQ. 352. Beginning with the 1st of September, 1919?

A. Yes.

XQ. 353. And this German article you likewise read beginning with September 1, 1919?

A. I did.

XQ. 354. Now, what else did you read?

A. I read numerous papers on the organic chemistry of arsenic not only related to arsphenamine——

XQ. 355. I am speaking now of arsphenamine, if you can give me that.

A. I read the bulletin which was written by Myers and Dumet from the Public Health Service.

XQ. 356. United States Public Health Service?

A. Yes.

XQ. 357. A bulletin written by someone in the Public Health Service, when?

A. I read that in the fall of 1919, also.

XQ. 358. After September 1st?

A. Yes.

XQ. 359. And that was published when?

A. I do not recollect the date at which that was published.

XQ. 360. What else?

A. Several papers have been published by some English workers and have appeared in the journals of the London Chemical Society, I think, in 1921.

XQ. 361. No, I mean in 1919. Before you made your first experiment, I was interested to know what you had read?

A. As far as I can remember, that is all the reading on arpshenamine that I had done.

XQ. 362. That is, you had read the German paper by Dr. Ehrlich; you had read the paper by Dr. Kober; and the bulletin of the United States Public Health Service?

A. I had.

XQ. 363. Doctor, is it true that arsphenamine cannot be purified if you start with an impure intermediate?

A. Arsphenamine—

XQ. 364. Just answer yes or no, please.

MR. ANDERSON: I think he is entitled to answer fully.

A. No, it cannot be purified because the chemical and physical properties of arsphenamine are such that the impurities which are present are very difficult to remove.

XQ. 365. Is it not necessary, therefore, in order to produce an arsphenamine which can be safely used upon human beings to start with a pure intermediate?

A. No. My experiments do not show that.

XQ. 366. That is, you have started with an impure intermediate and have obtained good arsphenamine?

A. I have.

XQ. 367. I suppose you did that purposely?

A. Intentionally.

XQ. 368. Doctor, do you know anybody interested in this case?

A. I do not.

XQ. 369. Have you had any relations with the United States Public Health Service?

A. Not prior to seeing Mr. Wright on Monday.

XQ. 370. Well, Mr. Wright is of the Department of Justice?

A. Yes.

XQ. 371. But I mean of the United States Health Service?

A. I have met Dr. McCoy since I have been here; that is all.

XQ. 372. You do not know Mr. Herman Metz?

A. I have met Mr. Metz, but I do not consider it knowing him.

XQ. 373. When did you meet him?

A. I met Mr. Metz very late in December of 1922.

XQ. 374. Where?

A. In New York.

XQ. 375. At his office?

A. At his laboratory in Brooklyn.

XQ. 375-a. In connection with salvarsan?

A. We talked of salvarsan.

XQ. 376. How did you come to go to see Mr. Metz?

A. I was in New York returning from Pittsburgh and had met Dr. Myers, of the Metz Laboratory, and while waiting for a train I went over to see them, unknown to them and unexpected by them, just as a personal visit.

XQ. 377. That is the first time that you met Mr. Metz?

A. The first time that I met Mr. Metz.

XQ. 378. And then you had been in correspondence with him?

A. I had never had any correspondence with Mr. Metz.

XQ. 379. Have you met him since?

A. I have not.

XQ. 380. Have you heard from him?

A. I have not.

XQ. 381. Do you know who gave your name as a witness who might testify in this case?

A. I do not.

MR. ANDERSON: I will be very glad to tell you that, if you wish the information.

XQ. 382. Will you produce your records in the morning?

A. I will.

MR. KRESEL: That is all until then.

MR. ANDERSON: If counsel is going to cross-examine further when the record is here, if your Honor pleases, I will ask leave to do it all at once —my redirect.

THE COURT: How many more witnesses have you, if you care to state, Col. Anderson?

MR. ANDERSON: At the present time it is my opinion we will not put on the stand more than three and at the outside four additional witnesses, and they will be short; unless the cross-examination is long I think the evidence will be concluded tomorrow.

THE COURT: Do you think it is possible to close the evidence then?

MR. ANDERSON: I would prefer not going on now. I would rather not sit at night. At the end of the day I am thoroughly fagged, and I think I will conclude this case tomorrow, but I would rather sit tomorrow night than tonight, if that is agreeable to counsel.

THE COURT: I do not believe that would be quite fair to all concerned. I am perfectly willing to do it.

MR. ANDERSON: I can state to your Honor that so far as I am concerned the examination of these witnesses, I am very sure, will not consume more than two or three hours.

THE COURT: But here is a witness who, with neither side abusing their privileges, has taken two or three hours. I do not know exactly how long he has taken, but judging the time that he probably went on the stand, he has taken two hours and a half, and three of them would take seven and a half.

MR. ANDERSON: It is my opinion that it is im-

possible to conclude this case before Monday, your Honor, because each side will have records to introduce.

THE COURT: If it would be any satisfaction to you, we would adjourn tomorrow noon until Tuesday instead of Monday. But there is one question I would like to ask. I dislike to break into the cross-examination or the examination in chief, but I want this information anyway.

I will ask whether you derived any information as to the making of salvarsan from any individual. You have been asked with respect to the patent and the literature that you have read, and I am curious to know whether Dr. Reed Hunt or other scientists of his standing gave you any information with respect to the making of salvarsan prior to your making the first experiment?

THE WITNESS: They did not.

MR. KRESEL: Or any manufacturer of salvarsan?

THE WITNESS: No manufacturer.

MR. KRESEL: And nobody else?

THE WITNESS: I have talked with nobody.

MR. ANDERSON: I would be very glad, if counsel is willing, to have the witness state how he came to make all these experiments. There is a good reason for it. I asked the question and he objected to it.

MR. KRESEL: I am not curious on that score. If I were, I would ask the question.

MR. ANDERSON: I asked the question, and he objected.

(Following is a list of documents referred to in Defendant's Exhibit No. 318, and offered in evidence by Mr. Kresel as Defendant's Exhibits, at page 4404 of the record:)

Printed sheet from Wall Street Journal,

March 10, 1921, entitled "Dyes and Defense" received in evidence and marked "Defendant's Exhibit No. 324." (*Not printed.*)

Pamphlet entitled "Statements of Henry B. Thompson and Albert M. Patterson" received in evidence and marked "Defendant's Exhibit No. 325." (*Not printed.*)

Pamphlet entitled "Statement of Mr. Francis P. Garvan, Alien Property Custodian," received in evidence and marked "Defendant's Exhibit No. 326." (*Not printed.*)

Reprint of editorial article by Dr. Frank Crane in the Globe and Commercial Advertiser, entitled "Books I have Met" received in evidence and marked "Defendant's Exhibit No. 327." (*Not printed.*)

Booklet entitled "Molecules and Man," by Robert E. Rose, Ph. D., received in evidence and marked "Defendant's Exhibit No. 328. (*Not printed.*")

Pamphlet entitled "The Chemical Industries of German Rhineland," received in evidence and marked "Defendant's Exhibit No. 329." (*Not printed.*)

Page from Literary Digest for December 18, 1920, article entitled "The Truth about American Dyes" received in evidence and marked "Defendant's Exhibit No. 330." (*Not printed.*)

Page from Manufacturers' Record, of January 13, 1921, article entitled "Has America no answer for This German Threat?" received in evidence and marked "Defendant's Exhibit No. 331." (*Not printed.*)

Printed article headed "Says Longworth Dye Bill Offers Best Solution" received in evidence and marked "Defendant's Exhibit No. 332." (*Not printed.*)

Printed article headed "Shall America Remain the only Important Country at the Mercy of the German Chemists?" received in evidence and marked "Defendant's Exhibit No. 333." (*Not printed.*)

Reprint of Article from Chemical and Metallurgical Engineering, January 5, 1921, entitled "Chemical Disarmament," by V. LeFebure, received in evidence and marked "Defendant's Exhibit No. 334." (*Not printed.*)

Record book containing report of Hearings before a Sub-Committee of the Committee on the Judiciary, United States Senate Sixty-sixth Congress, 3rd Session, January 19 to March 3, 1921, received in evidence and marked "Defendant's Exhibit No. 335." (*Not printed.*)

Volume containing report of Hearings before the Committee on Ways and Means, House of Representatives, on H. R. 2706 and H. R. 6495, June 18-20 and July 14-18, 1919, received in evidence and marked "Defendant's Exhibit No. 336." (*Not printed.*)

Reprint of Article from New York American, March 25, 1921, entitled "German Dyestuffs This Year Will Top Big Pre-War Output" received in evidence and marked "Defendant's Exhibit No. 337." (*Not printed.*)

Reprint of Article from the Rural New Yorker, February 12, 1921, entitled "Will the Chemist Compete with Farmers?" received in evidence and marked "Defendant's Exhibit No. 338." (*Not printed.*)

Reprint of Article from The Scranton Republican, March 25, 1921, headed "Dye Makers Must be Given Chance," received in evidence and marked "Defendant's Exhibit No. 339." (*Not printed.*)

Pamphlet of Department of the Interior, Bureau of Education, entitled "Treasure Hunting of Today and Chemistry in our Schools" received in evidence and marked "Defendant's Exhibit No. 340." (*Not printed.*)

Page from Minneapolis Sunday Tribune, April 10, 1921, Article entitled "Future of United States in hands of chemists, Slosson Warning," received in evidence and marked "Defendant's Exhibit No. 341." (*Not printed.*)

Pamphlet entitled "Memorandum Prepared by the American Dyes Institute in respect to the Longworth Bill H. R. 8078 in the Senate of the United States, British Dye Licensing Bill," received in evidence and marked "Defendant's Exhibit No. 342." (*Not printed.*)

Reprint of Article from the Journal of Commerce, April 5, 1921, entitled "Hoover Considers Dye Industry Aid" received in evidence and marked "Defendant's Exhibit No. 343." (*Not printed.*)

Reprint of page from The New York Herald, Sunday, May 8, 1921, article headed "World Mastery Lies in 'Dew of Death'" received in evidence and marked "Defendant's Exhibit No. 344." (*Not printed.*)

Reprint of Article from New York Times, May 23, 1921, entitled "Embargo is urged on German Dyes," received in evidence and marked "Defendant's Exhibit No. 345." (*Not printed.*)

Book entitled "The Next War" received in evidence and marked "Defendant's Exhibit No. 346." (*Not printed.*)

Pamphlet entitled "Those Unreliable American Dyes" received in evidence and marked "Defendant's Exhibit No. 347." (*Not printed.*)

Photostat sheets entitled "An Appeal" received in evidence and marked "Defendant's Exhibit No. 348." (*Not printed.*)

Booklet entitled "What about Chemical Warfare?" received in evidence and marked "Defendant's Exhibit No. 349." (*Not printed.*)

Booklet entitled "Reprint and Circular Series of The National Research Council" received in evidence and marked "Defendant's Exhibit No. 350." (*Not printed.*)

Pamphlet entitled "Why Tariff Duties Alone Will Not Now Protect The American Dye Industry" received in evidence and marked "Defendant's Exhibit No. 351." (*Not printed.*)

Reprint from Congressional Record of Saturday, July 9, 1921, speech of Hon. Caleb R. Layton received in evidence and marked "Defendant's Exhibit No. 352." (*Not printed.*)

Copy of "The Yale Alumni Weekly" of May 12, 1922, received in evidence and marked "Defendant's Exhibit No. 353." (*Not printed.*)

Pamphlet entitled "Dye Tariff and License Control" received in evidence and marked "Defendant's Exhibit No. 354." (*Not printed.*)

Pamphlet entitled "Testimony of the Army & Navy On True Preparedness Without Taxation," received in evidence and marked "Defendant's Exhibit No. 355." (*Not printed.*)

Pamphlet entitled "Before the Finance Committee of the United States Senate, Hearings on the Tariff Bill H. R. 7456," received in evidence and marked "Defendant's Exhibit No. 356." (*Not printed.*)

Pamphlet entitled "Address of Francis P. Garvan," of September 7, 1921, delivered before the Joint Session of the Society of Chemical Industry and the American Chemical Society, at

Columbia University, received in evidence and marked "Defendant's Exhibit No. 357." (*Not printed.*)

Reprint of article from The New York Times, September 17, 1921, entitled "Coals to Newcastle" received in evidence and marked "Defendant's Exhibit No. 358." (*Not printed.*)

Copy of address of Senator Irvine L. Lenrott, on "The Relation of Our Chemical Industry to our National Defense," before the Chemical Exposition, New York City, September 28, 1921, received in evidence and marked "Defendant's Exhibit No. 359." (*Not printed.*)

Booklet entitled "Why Dyestuff Imports should be Licensed," by G. D. McDonald, received in evidence and marked "Defendant's Exhibit No. 360." (*Not printed.*)

Booklet entitled "Why The Coal Tar Industry Must Be Preserved and How to Accomplish It," by S. Isermann, received in evidence and marked "Defendant's Exhibit No. 361." (*Not printed.*)

Article entitled "German Cartel Seen As Factor in Dyes Ruling," appearing in Daily News Record of Wednesday, December 28, 1921, received in evidence and marked "Defendant's Exhibit No. 362." (*Not printed.*)

Booklet entitled, "How Germany, England, Italy, France and Japan have protected their organic chemical industries by special legislation," received in evidence and marked "Defendant's Exhibit No. 363." (*Not printed.*)

Atlantic Monthly Magazine, issue of June, 1922, received in evidence and marked "Defendant's Exhibit No. 364." (*Not printed.*)

Copy of the Yale Alumni Weekly of May 12, 1922, "Chemical Number," received in evidence

and marked "Defendant's Exhibit No. 365." (*Not printed.*)

Pamphlet entitled, "The Chemical Question," by Francis P. Garvan, President of the Chemical Foundation, received in evidence and marked "Defendant's Exhibit No. 366." (*Not printed.*)

Book entitled "Testimony of Francis P. Garvan, President of the Chemical Foundation, Before the Sub-Committee of the Commitee on the Judiciary United States Senate, March 1, to March 7, 1922, Senate Resolution No. 77," received in evidence and marked "Defendant's Exhibit No. 367." (*Not printed.*)

THE COURT: We will adjourn now until 8.30 tomorrow morning.

(Whereupon, at 4.30 o'clock P. M., an adjournment was taken until Saturday, July 21, 1923, at 8.30 o'clock A. M. Standard Time.)

THIRTY-THIRD DAY.

Wilmington, Delaware,
July 21st, 1923, at 8.30 o'clock A. M.
Standard Time.

Before:
HON. HUGH M. MORRIS, *U. S. District Judge.*

Counsel present as before noted.

TRIAL RESUMED BEFORE THE COURT.

MR. ANDERSON: Before beginning the proceeding this morning I would like to say to the Court that I have asked Dr. McCoy to return to Washington and get the original records which I think

should be introduced in this case in view of the developments of the testimony. He tells me he cannot get them back here before Monday because it requires some photostating. For that reason it is impossible for us to close the case today, as I had earnestly hoped to do, and therefore I would like to ask the wishes of the Court.

THE COURT: It seems that we can close on Monday beyond all question; can we?

MR. ANDERSON: I could not say that, if your Honor please. It is impossible. I am going to shorten the evidence as much as possible and it ought to be closed in a day or two days. I will do my best. I had hoped yesterday morning I could close this week, but I feel it is very important, of course, to put in the original evidence and meet this situation fully; and, as your Honor knows, there are a great many issues we have got to meet that have been raised, which may prolong the examination. I am shortening and cutting out any witness I do not feel it is absolutely necessary for me to put on and doing all I can to close it.

THE COURT: I am starting with that assumption.

MR. ANDERSON: My own feelings would make me do that, if nothing else; because I am very tired.

MR. KRESEL: I must say, your Honor, that I am extremely disappointed to hear that counsel cannot close their case today. The statement was made yesterday afternoon that they could, that they had three but no more than four witnesses to put on. Now it is not even promised that it can be closed Monday. I think we are entitled to know as nearly as counsel can indicate it, how many witnesses there are to be called and how long it is probably going to take. If there is danger

of this case not being finished by Monday, I am going to so far impose upon your Honor's good nature to ask you to sit Monday night so that we can finish it.

THE COURT: I will do that. I will do that because I appreciate the difficulty of being able to say at just what moment you are going to close.

MR. KRESEL: Oh, yes, I know that.

MR. ANDERSON: I will be very glad to co-operate with the Court to the maximum of my ability, both in shortening the evidence and in other things; but I must, of course, do whatever I conceive to be my duty, and I know your Honor does not desire me to do otherwise.

THE COURT: I realize the difficulties.

MR. ANDERSON: And there are a great many points that the Government ought to put in rebuttal on. I am going to limit it as far as I can posibly do it. There are four weeks of evidence that we have got to meet and it is hard to do that in a few days.

THE COURT: Suppose you proceed now, and unless we can get through today we will not go on during the afternoon—unless we find that it is necessary to go on during the afternoon to get through on Monday. I want to get through on Monday.

MR. ANDERSON: I have stated, your Honor, what I am trying to do. If it would be possible for your Honor to say, I would like to know, because there is one and possibly more witnesses that I would have to bring here today if we go on this afternoon. I do not think it will be necessary unless there is some development this morning that I do not know about.

THE COURT: Then we will not go on this afternoon, but let us begin Monday morning at nine o'clock.

MR. ANDERSON: Very good, sir. With the Sunday intervening I shall try to further shorten the evidence by examining the evidence which I have got to meet more carefully than I have heretofore done.

THE COURT: Let us begin Monday morning at nine o'clock, and we will sit in continuous session thereafter until we are done. There will be no adjournment, it will be a continuous session when we begin on Monday morning. Get all of your witnesses, both sides, and if there is any sur-rebuttal will you be prepared to go on Monday morning in continuous session. That will be eight o'clock standard time on Monday.

WALTER G. CHRISTIANSEN resumed the stand.

MR. KRESEL: I do not propose to proceed with the cross-examinaion of this witness until I have had an opportunity to examine his records. May I state to your Honor that at the adjournment yesterday afternoon I suggested to Mr. Galloway that if those records could be made available to me for examination last night, it would shorten our cross-examination.

THE COURT: But you have not seen them, Mr. Kresel?

MR. KRESEL: I have not seen them and have not had an opportunity to.

THE COURT: Then will you examine the witness so far as to ascertain whether he has them available for your inspection?

CROSS-EXAMINATION (Continued).

By MR. KRESEL:

XQ. 383. Dr. Christiansen, have you with you now the records of your experiments that you testified about yesterday?

A. I have.

XQ. 384. Will you produce them, please?

A. They are in here (producing envelope containing papers). Be very careful of those, because that is original data.

XQ. 385. I shall certainly be very careful indeed.

A. And I might state that in any case of your going over those, I would like to be present with you.

XQ. 386. If I desire any explanation, I shall be very glad to avail myself of your offer.

A. Because that is all the data which I have of my four years' work and I want to see that it is not mixed up or confused in any way.

XQ. 387. I shall be personally responsible to you for returning these to you in the same condition that they are in, and every one of them; you need not fear for that. And if desired, if you feel that it would be safer for you, I shall be perfectly willing to have the clerk mark them, so that there may be no doubt as to how many there are. Would you prefer that?

A. I have got them all numbered.

XQ. 388. You have? Very well.

A. The only thing is, if the papers got mixed up, it would be an enormous proposition to——

XQ. 389. I will keep them in the same order.

(No answer.)

By The Court:

Q. 390. Are they so numbered that they can be restored to their present order if they should be dropped, for instance?

A. They could with considerable trouble.

Q. 391. But why not mark them so that there would be no difficulty about that?

By Mr. Kressel:

XQ. 392. They are marked consecutively, are they not? Up in the upper part of the page I see "1," "2," "3."

A. But not all the way through.

By THE COURT:

Q. 393. Why not do that now, Mr. Christiansen, with a pencil, and just number them consecutively from beginning to end, so that there will be no difficulty about it?

MR. KRESEL: That is all for the present.

Q. 393. (Continued.) And then you can pass them over to Mr. Kresel as you get them marked.

(Witness marks papers.)

MR. ANDERSON: Of course, my re-direct awaits the completion of the cross-examination.

THE COURT: Oh, yes.

MR. ANDERSON: I will call Dr. Freedman.

THIRTY-FOURTH DAY.

Wilmington, Delaware,
July 23, 1923, at 8 o'clock A. M.
Standard Time.

Before:

HON. HUGH M. MORRIS, *U. S. District Judge.*

Counsel present as before noted.

TRIAL RESUMED BEFORE THE COURT.

MR. KRESEL: I am ready to proceed with the cross-examination of Dr. Christiansen.

WALTER G. CHRISTIANSEN resumed the stand.

CROSS-EXAMINATION (Continued).

By MR. KRESEL:

XQ. 394. Dr. Christiansen, is it not true that until a test is made of the yellow powder that you obtained as a result of your experiments, you could not

tell whether what you had obained was a poison or a cure?

A. Would you state what kind of a test you mean?

XQ. 395. I mean the test on the animals.

A. Was a poison or a cure?

XQ. 396. Yes.

A. One test could not settle that point. There are two points to be settled there.

XQ. 397. Well, more than one test, then, was necessary to determine that?

A. One test could determine to what degree that drug was poisonous. Every drug, no matter what it is, is poisonous to a certain degree, that is absolutely known, and one test would determine to what extent this yellow powder was poisonous. That is one test which could be made.

XQ. 398. What you mean is that it all depends upon the toxicity?

A. Every drug has toxicity and——

XQ. 399. No, I am speaking of this drug, if you will permit me.

A. This drug has a toxicity.

XQ. 400. The important feature in the drug, the thing that decides whether it can be safely injected into the veins of a human being is its toxicity?

A. It is.

XQ. 401. Now, may I have the salvarsan patent, Mr. Clerk? I have been examining your notes and I am going to hand you now your notes of your first experiment; those are the notes, are they not? (Handing papers to witness.)

A. They are.

XQ. 402. Now, as I understand your testimony, you started following the patent only at the point where you had already made your intermediate; is that right?

A. In this experiment?

XQ. 403. I am speaking of your first experiment?

A. Yes.

XQ. 403a. That is true, is it not?

A. Yes.

XQ. 404. I think you told us that it took you three months to prepare your intermediate.

A. Yes. I would like to explain that if I may.

XQ. 405. Well, all I am interested in, is the time; and those notes that you have handed me are not the notes of your work on the intermediate at all?

A. They are not.

XQ. 406. You have an entirely separate set of notes for that?

A. I have.

XQ. 407. Very well. So in the experiments as to which you testified last Friday and Saturday, namely, those 1200 experiments, you started with an intermediate already prepared?

A. In those of the 1200 experiments in which I prepared arsphenamine, you will recall I said some of those 1200 experiments were in preparation of derivatives and analogous compounds. In those in which I prepared arsphenamine, I started with the last intermediate, namely, nitrohydroxyarsonic acid.

XQ. 408. Exactly. Now then, I will hand you the patent, Defendant's Exhibit No. 156, and I wish you would point out to me the line in that patent where you started following it.

A. Line 57.

XQ. 409. Let me see it please. Line 57. In other words, you start with the figure "66 grams." Is that right?

A. I would start at that point.

XQ. 410. Now, that is all I have asked you so far. Starting at that point, the patent says as follows: "66 grams of nitrooxyphenylarsinic acid are dissolved

in 1320 cubic centimeters of water. That is the first thing is it not?

A. Yes.

XQ. 412. Read me from your notes, how many grams of nitrooxyphenylarsinic acid you took.

A. I used 32.9 grams.

XQ. 413. Instead of 66?

A. Instead of 66.

XQ. 414. So that in that respect you did not follow the patent?

A. No. Let me explain——

XQ. 415. That is all I am asking you.

MR. ANDERSON: I think he is entitled to explain, sir. He is entitled to explain his answer, after he says no.

MR. KRESEL: Upon this subject I think I want only the categorical answers I am entitled to.

THE COURT: Does the patent give any latitude with respect to that?

MR. KRESEL: The patent says "66 grams of nitrooxyphenylarsinic acid are dissolved in 1320 cubic centimeters of water."

MR. ANDERSON: Now suppose he took one-half of that amount and one-half of that amount of water; is that not exactly the same thing?

THE COURT: I do not know.

MR. KRESEL: All I am pointing out, first, is wherein he deviated from the patent. I shall take up the proportions that he took. I will bring all that out.

THE COURT: I think, Colonel Anderson, as I now see it, that he either took the proportions or did not. His reasons for not taking them seem to me immaterial. You can bring that out on redirect if it is not brought out here. What was the weight that he used?

MR. KRESEL: 32.9 grams.

THE COURT: Very well.

XQ. 416. The patent then goes on to say that those 66 grams of nitro-oxyphenylarsinic acid are dissolved in 1320 cubic centimeters of water. Read me from your notes how many cubic centimeters of water you used.

A. I used 773 cubic centimeters of water.

XQ. 417. Instead of 1320. I want to stop there, Dr. Christiansen. Instead of 66 grams of nitro-oxyphenylarsinic acid you took 32.9 grams?

A. I did.

XQ. 418. That is less than half, is it not?

A. Yes.

XQ. 419. One-tenth of a gram less than half of the prescribed amount in the patent?

A. Yes.

XQ. 420. Right?

A. Yes.

XQ. 421. Did you intend to take half?

A. I cannot say now what I intended.

XQ. 422. Very well. You took 32.9?

A. I did.

XQ. 423. How much would be the proportion of water that you should have taken to the proportion that 32.9 grams bears to 66 grams?

A. Very little less than half of the total amount of water.

XQ. 424. A little less than half. Now, the patent says you should take 1320 cubic centimeters of water. You took 773?

A. I did.

XQ. 425. That is a great deal more than half, is it not?

A. That is about 100 cubic centimeters more.

XQ. 426. More than that. So you not only varied from the amount which the patent specifies, but if you started in by taking half the ingredients, you used 100

cubic centimeters at least more of water than you would have required on that basis?

A. I did.

XQ. 427. The patent proceeds to say that after taking 66 grams of this nitro-oxyphenylarsinic acid, dissolving it in 1320 cubic centimeters of water, there should also be added 225 cubic centimeters of caustic soda lye of twice the normal strength. Now, how much of caustic soda lye of twice the normal strength did you use, reading now from your notes?

A. I added 10 grams of solid caustic soda to the water.

XQ. 428. Ten grams of caustic soda equal how many cubic centimeters of caustic soda lye twice the normal strength?

A. If that ten grams of solid caustic soda would dissolve in approximately 100 cc.'s more water which I used, I would have a half of what he states should be added to normal caustic soda. In other words the 100 cc.'s of water were added on to the total amount of water and the weight of caustic soda which would be added was added in the solid form, which is exactly equivalent to what he says.

XQ. 429. Dr. Christiansen, I think you are in error. Let me follow it up. Is it not the fact that normal soda lye contains four grams of caustic soda in 100 cubic centimeters?

A. It is.

XQ. 430. Therefore, is it not the fact that twice the normal strength of soda lye contains eight grams in 100 cubic centimeters?

A. That is true.

XQ. 431. Therefore, one gram is contained in 12½ cubic centimeters, is it not?

A. It is.

XQ. 432. And if you used 10 grams, that is equivalent to 125 cubic centimeters, is it not?

A. It is.

XQ. 433. Very well. So we have it, then, that you used 125 cubic centimeters of caustic soda lye twice the normal strength?

A. I did not.

XQ. 434. You just told me——

A. May I explain that?

XQ. 435. No, you may not. Let us first see where we differ.

A. All right.

XQ. 436. I thought you just told me than ten grams of caustic soda do equal 125 cubic centimeters of caustic soda lye twice the normal strength.

A. Ten grams of pure caustic soda. Now, there is a difference here. I used caustic soda such as we buy, and get it in bottles, and that cannot be obtained as 100 per cent. caustic soda.

XQ. 437. Is there anything in your notes which says that it is not pure caustic soda?

A. I know——

XQ. 438. Never mind what you know.

A. All right, sir.

XQ. 439. I am asking you what your note shows.

A. My note does not show.

XQ. 440. Your note shows that you used ten grams of caustic soda. Now, assuming that caustic soda to be pure caustic soda, it would equal 125 cubic centimeters of caustic soda lye twice the normal strength?

A. If that were pure caustic soda.

XQ. 441. If you were using half of the ingredients, then, instead of the 225 cubic centimeters of caustic soda lye twice the normal strength required by the patent, you would have had to use 112½ cubic centimeters?

A. I would.

XQ. 442. In point of fact, if the soda lye was pure, you used 125 cubic centimeters?

A. If it were pure.

XQ. 443. Now, you say it was not pure?

A. It was not.

XQ. 444. And not being pure, its strength is less, is it?

A. It is.

XQ. 445. And how much less was it?

A. That is a variable quantity.

XQ. 446. So that as between 125 centimeters of caustic soda lye at 112½, you cannot really tell how much you had? It was in between those two figures because of the impurity of it, is that it?

A. I can tell fairly close.

XQ. 447. Well, how much did you have, less than 125 or more than 125?

A. The caustic soda——

XQ. 448. Just answer my question. Was it less than 125?

A. I had less than 125.

XQ. 449. How much less? How much did you have?

A. I had approximately 91 or 92 per cent. of 125 cubic centimeters.

XQ. 450. 91 per cent. of 125. Let us get that. That would give you 113¾?

A. Yes.

XQ. 451. So, instead of 112½ cubic centimeters required by the patent, assuming that you were using only half the quantities, you had 113¾?

A. That is, within my experimental error.

XQ. 452. I do not know what it is. That is the figure you had?

A. That is the figure.

XQ. 453. Now I proceed to follow the patent. The patent says that you should introduce all this into a

solution of 855 grams of anhydrous sodium hydrosulphit. Read from your notes and tell me how much of anhydrous sodium hydrosulphit you used.

A. I used 492 grams of sodium hydrosulphit.

XQ. 454. And if you were using half quantities, you should have used 427½, should you not?

A. I should.

XQ. 455. The patent proceeds to say that this should be put not only into 85.5 grams of anhydrous sodium hydrosulphit but also into 171 grams of crystallized magnesium chloride; right?

A. It does.

XQ. 456. How much of crystallized magnesium chloride did you use according to your notes?

A. I used 86.5 grams of magnesium chloride hexahydrate. That means the hydrate contents, 6 molecules of water.

XQ. 458. If you were using half quantities, you should have used 85½ instead of 86½; is not that right?

A. What is the figure given in the patent?

XQ. 458. Half of 171.

A. Yes.

XQ. 459. Then the patent says that you should put all this stuff into 4275 cubic centimeters of water. Read me from your notes and tell me how much water you used.

A. I used 2110 cubic centimeters of water.

XQ. 460. Instead of 2137½, if you were using half the quantities, is that right?

A. Yes.

XQ. 461. So now I have taken you over the first six steps of this patent, and it is true, is it not, that in none of the six did you use the exact quantities specified in the patent, is that right?

A. Yes. Now, may I——

XQ. 462. No. And in none of the six steps did

you use half of the quantities specified in the patent, is that right?

A. Not exactly half.

XQ. 463. I will proceed with the patent. The patent says that you should digest the solution at 50 degrees Centigrade, is that right?

A. It does.

XQ. 464. Tell me from your notes what you did in digesting it. At what temperature did you digest it?

A. I digested this material at 55 to 60 degrees.

XQ. 465. 55 to 60 instead of 50?

THE COURT: Is there any latitude in the patent?

MR. KRESEL: No latitude. Let me read it to your Honor. "On digesting the solution at 50 degrees centigrade." It does not say "about." It does not say "more or less."

XQ. 466. Your note says that you kept it at 55 to 60 degrees for how long?

A. Two hours and thirteen minutes.

XQ. 467. Show me anything in the patent which says as to how long it should be kept at that heat.

A. The patent——

XQ. 468. Is there anything there?

A. There is no time given in the patent.

XQ. 469. You kept it at 55 degrees for 20 minutes first, did you not, according to your notes?

A. I did not.

XQ. 470. Read me your note there.

A. Heat to 55 degrees Centigrade in 20 minutes.

XQ. 471. In 20 minutes? What do you mean by "in 20 minutes"? You wait for 20 minutes and then heat it?

A. No.

XQ. 472. What does that mean?

A. That the solutions were mixed at room tem-

perature, which temperature I cannot state, and then were heated to 55 degrees, and the time occupied by that heating was 20 minutes.

XQ. 473. Is there anything in the patent which says how long you should heat this?

A. Just what do you mean?

XQ. 474. Don't you understand the question?

A. Do you mean——

THE COURT: I think the question bears one or two meanings, whether the patent says taking 20 minutes in bringing it from room temperature to 55 degrees, or two hours and fifteen minutes.

THE WITNESS: That is what I want to know.

XQ. 475. Is there anything in the patent which says how long you should take in raising the temperature from room temperature to 55 degrees?

A. There is not.

XQ. 476. Is there anything in the patent which tells you how long to keep it at 55 degrees, or any temperature?

A. There is.

XQ. 477. Where? (Handing witness paper.)

A. It says to continue the digestion until a sample which is removed——

XQ. 478. Just read the portion of the patent that you referred to; and the line, if you will, please.

A. I am in error. It is——

XQ. 479. That is all. Never mind as long as you are in error; that is all I am interested in. But you did keep this heated up for two hours and thirteen minutes?

A. I did.

XQ. 480. And you kept the temperature at between 55 and 60 degrees Centigrade; is that right?

A. I did.

XQ. 481. Then the patent says that the mixture should be filtered?

A. It does.

XQ. 482. And you did filter it according to your notes?

A. I did.

XQ. 483. You say in your notes that after filtering it you washed it with water.

A. I did.

XQ. 484. Is there anything in the patent which says you should wash it with water? (Handing witness paper.) And point out the line.

A. There is not.

XQ. 485. The patent then says that you should dry the mixture, does it not?

A. It does.

XQ. 486. Your notes say that you dried it in a vacuum over caustic soda?

A. It does.

XQ. 487. Anything in the patent which says you should dry it in a vacuum or that you should dry it in a vacuum over caustic soda?

A. There is not.

XQ. 488. Your notes say that you dried it for 44 hours.

A. They do.

XQ. 489. Is there anything in the patent which tells you to dry it for 44 hours?

A. There is not.

XQ. 490. Dr. Christiansen, did you not realize when you were testifying here on Friday and on Saturday that you answered my questions and Colonel Anderson's questions—or rather I will put it the other way, Colonel Anderson's and my questions, and that you positively stated that you in your first experiment obtained arsphenamine following exactly the specifications in this patent and not varying one way or the other?

A. Yes. Now may I explain? I considered that

these things which I have done are following the patent, and I can give reasons for these things which I have done.

XQ. 491. Never mind your reasons; you can bring them out later. But you now admit, do you not, that in no step outlined in your notes there did you follow the patent?

A. Not as you interpret the patent.

XQ. 492. Not as I interpret it, but as the patent reads; isn't that right?

A. Yes.

XQ. 493. When you get to this point that we have arrived at you have not arsphenamine, but a base for arsphenamine; isn't that right?

A. That is true.

XQ. 494. And the patent does not then proceed to tell what to do with that base in order to get arsphenamine, does it?

A. May I see the patent?

XQ. 495. There. (Handing witness patent.)

A. The patent says how this base may be converted into its dihydrochlorid.

XQ. 496. What does it say about it?

A. "Its dihydrochlorid, which may be precipitated from a methyl-alcoholic solution by ether, is a light yellow powder, readily soluble in water and methyl-alcohol, scarcely soluble in methyl alcohol, insoluble in ether or benzene; it decomposes when heated at about 190 degrees C."

XQ. 497. In other words, all that it tells us is that the dihydrochlorid of this base may be precipitated by using methyl-alcohol and ether?

A. It does.

XQ. 498. Did you undertake to use the base that you obtained and get therefrom the dihydrochlorid?

A. I did.

XQ. 499. Please read from your notes just what you did to get the dihydrochlorid.

A. "9.5 grams of base"——

XQ. 500. Stop there. Is there anything in the patent which says that you should take 9.5 grams of the base?

A. There is not.

XQ. 501. Go on.

A. "——was dissolved in 284 c.c.'s of methyl-alcohol, to which 50 c.c. of methyl-alcoholic hydrochlorid——"

XQ. 502. Was added?

A. "——was added."

XQ. 503. Is there anything in the patent which gives you those ingredients or the amount thereof?

A. There is not.

XQ. 504. Go ahead.

A. My notes say "the base dissolves nearly completely——"

XQ. 505. Well, that is simply descriptive. Go on.

THE COURT: It says what?

MR. KRESEL: The base dissolved nearly completely.

A. (Continuing.) "The yellow filtered solution is poured into 600 cubic centimeters of ether contained in an ice bath."

XQ. 506. Stop there, please. Is there anything in the patent that says you should do it in an ice bath?

A. There is not.

XQ. 507. Is there anything in the patent which tells you how many cubic centimeters of ether you should use?

A. There is not.

XQ. 508. Go on.

A. "At first a precipitate formed which later redissolved. 600 cubic centimeters——"

XQ. 509. That is merely descriptive.

A. All right, sir.

XQ. 510. Go on.

A. "600 cubic centimeters more of ether are added and a yellow precipitate is obtained."

XQ. 511. Is there anything in the patent which tells you to use 600 cubic centimeters of ether?

A. There is not.

XQ. 512. Go on.

A. "The yellow precipitate was filtered, washed with ether, and dried in vacuum over sulphuric acid. Thereby 7.7 grams of a yellow solid is obtained."

XQ. 513. Is there anything in the patent which tells you to filter it and to wash it and to dry in vacuum?

A. There is not.

XQ. 514. Dr. Christiansen, you testified on Friday that not only did you get arsphenamine by strictly following the outline in the patent and without deviating from it in the slightest degree, but you also testified that you got a 90 per cent. yield of the theoretical yield, did you not?

A. I did, and here is——

XQ. 515. Now wait. Did you mean that you got a 90 per cent. yield of arsphenamine?

A. I meant that I got a 90 per cent. yield of the steps described in the patent.

XQ. 516. Did you mean to tell the Court that you got a yield of 90 per cent. of arsphenamine or of something else?

A. I meant to tell the Court I got 90 per cent. yield of arsphenamine base.

XQ. 517. You did not say that, did you? You were being questioned about arsphenamine, not a base.

A. I was being questioned about the steps in the patent.

XQ. 518. Were you not being questioned about what yield of arsphenamine you obtained?

A. I said I understood I was being questioned about the patent.

XQ. 519. What yield of arsphenamine did you obtain?

A. My yield of arsphenamine base was eighty——

XQ. 520. I did not ask you about base; I meant the arsphenamine.

A. In converting the arsphenamine base into the hydrochlorid I got 67.6 per cent. yield.

XQ. 521. 67 per cent. yield, but that 67 per cent. yield was 67 per cent. of your base yield, was it not?

A. It was.

XQ. 522. And your base yield was only 90 per cent. of the theoretical yield?

A. My base yield was 90 per cent. of the theoretical yield.

XQ. 523. Therefore, if you take 67 per cent. of 90 per cent., it is about 60 per cent., is it not, two-thirds of 90, in round figures?

A. It is, slightly over; yes, sir.

XQ. 524. And so instead of getting a yield of arsphenamine, as you testified on Friday, you got only 60 per cent., did you not?

A. Including steps that are not in the patent.

THE COURT: I do not understand.

XQ. 525. But you said Friday you did nothing but what is in the patent, did you not?

A. In order to obtain a product which could be injected into animals, I had to convert the arsphenamine base.

XQ. 526. I do not care what you had to do, Doctor; I am considering your testimony, what you said Friday. Do you not recall that you testified—let me read it to you. I read from page 4480:

"XQ. 163. How much of a yield did you obtain in your first experiment? Do you know what I mean by 'Yield'?

A. You mean the weight of material I obtained, considering the amount I started with?"

Do you remember giving that answer?

A. I do.

XQ. 527. Yes, that is right, and your answer was "Oh, I obtained a very good yield which I should think was approximately 90 per cent. of the theoretical yield." Do you remember giving that testimony?

A. Yes.

XQ. 528. And do you remember when I asked you very shortly thereafter how much arsphenamine you had produced altogether and you told me 1500 grams?

A. I approximated.

XQ. 529. Approximately 1500 grams. Did you think I was talking about a yield on a base; is that your testimony now?

A. When you asked me how much arsphenamine I had prepared, I understood you to mean the hydrochlorid.

XQ. 530. The arsphenamine?

A. The arsphenamine.

XQ. 531. All right; and when I asked you what yield you had obtained, did not you understand me to speak of yield of arsphenamine?

A. I understood you to speak of yield according to the directions of the patent of base.

XQ. 532. Now, Doctor, I am going to take up with you two more of your outlines, because you have testified only about your first three experiments, you remember?

A. Yes.

XQ. 533. Now, I show you the second experiment. Now, here is your second experiment (handing paper). Read it, please. I am going to give you two minutes to read it, so that you know it. Now, have you the patent before you?

A. I have.

THE COURT: Have you had time to make such examination of it as you desire?

THE WITNESS: I have, sir.

XQ. 534. The patent says that you should start with 66 grams of nitro-oxyphenylarsinic acid. How many grams did you start with in your second experiment?

A. Twenty grams of nitro-hydroxyphenylarsinic acid.

XQ. 535. The patent says that you should dissolve it in 1320 cubic centimeters of water. How much water did you use?

A. I used 420 cubic centimeters of water.

XQ. 536. If you take the proportionate amount as between 20 grams of nitro-oxyphenylarsinic acid and 66 grams, how much water should you have used?

A. Slightly under one-third.

XQ. 537. To be exact, you should have used 399 cubic centimeters of water, is that right?

A. That is true.

XQ. 538. And you used 470 cubic centimeters of water, is that right?

A. Yes.

XQ. 539. Please answer my question. The patent says that you should add 225 cubic centimeters of caustic soda lye twice the normal strength. How much caustic soda did you add?

A. I added 6.01 grams of solid sodium hydroxide.

XQ. 540. And this equals 76 centimeters of soda lye, twice the normal strength, does it not?

A. If the caustic soda were pure.

XQ. 541. Was this impure?

A. This was the same type of caustic soda as in the first experiment.

XQ. 542. How many cubic centimeters of caustic soda lye twice the normal strength did this 6.01 grams of caustic soda equal?

A. Approximately 68 cubic centimeters.

MR. KRESEL: 68.2 to be exact.

XQ. 543. The patent says that you should introduce this into a solution of 855 grams of anhydrous sodium hydrosulphite?

A. It does.

XQ. 544. How much of that drug did you use?

A. I had 299 grams of commercial sodium hydrosulphite.

XQ. 545. 299 grams. Taking the proportion as between 20 and 66, you should have used 259 grams, should you not?

A. I should, if the——

XQ. 546. If the patent——

THE COURT: Just a minute, Mr. Kresel.

By THE COURT:

Q. 547. If what?

A. (Continuing.) If the hydrosulphite were of a definite purity.

By MR. KRESEL:

XQ. 548. What purity was it?

A. Commercial hydrosulphite is of a very variable purity, and I cannot say now what the purity of that hydrosulphite was in 1919.

XQ. 549. The patent says that you should use 171 grams of crystallized magnesium chloride. How much did you use?

A. I used 52½ grams of magnesium chloride hexahydrate.

XQ. 550. How much should you have used taking the proportion of 20 to 66?

A. Would you give me the total figure in the patent?

XQ. 551. 171.

A. Oh, I have it here. I should have used approximately 52 grams.

XQ. 552. And you used how much?

A. 52½.

XQ. 553. The patent says that you should pour all this into 4275 cubic centimeters of water?

A. It does.

XQ. 554. How much did you use?

A. I used 1310.

XQ. 555. Cubic centimeters of water?

A. Cubic centimeters of water.

XQ. 556. And in the proportion of 20 to 66, you should have used 1275 cubic centimeters, should you not?

A. I should.

XQ. 557. The patent says that you should digest the solution at 50 degrees Centigrade, does it not?

A. It does.

XQ. 558. What did you do?

A. I heated this solution during a period of 25 minutes, to 55 degrees.

XQ. 559. Instead of 50?

A. Instead of 50.

XQ. 560. And you kept at 55 to 60 degrees for how long?

A. One and three-quarter hours.

XQ. 561. As to which the patent is silent?

A. As to which it is silent.

XQ. 562. Then you filtered it off, did you not?

A. I did.

XQ. 563. And then you washed it with carbon dioxide solution, did you not?

A. With an aqueous solution of carbon dioxide.

XQ. 564. Aqueous solution of carbon dioxide. The patent does not say anything about washing it at all, does it?

A. It does not.

XQ. 565. Nor does it say you should wash it with an aqueous solution of carbon dioxide, does it?

A. It does not.

XQ. 566. In this respect your second experiment differs from your first, does it not?

A. In the use of——

XQ. 567. Doesn't it?

A. It does.

XQ. 568. In your first experiment, you washed it with water?

A. I did.

XQ. 569. Here you wash it with an aqueous solution of carbon dioxide?

A. I did.

XQ. 570. Then you say you dried it in a vacuum over caustic soda?

A. I did.

XQ. 571. As to which the patent is silent, except it says that it should be dried?

A. That is all.

XQ. 572. In your second experiment, you dried it for sixty hours?

A. I did.

XQ. 573. The patent is silent as to how long you should dry it?

A. It is.

XQ. 574. In your first experiment you dried it for forty-four hours?

A. I did.

XQ. 575. This again brings us to the base, does it not?

A. It does.

XQ. 576. Your second experiment shows that you reduced that base to the dihydro-chloride in an entirely different way from that which you followed in your first experiment, does it not?

A. Not as I understand my notes.

XQ. 577. Not as you understand your notes? Have you your first experiment notes there?

A. I have.

XQ. 578. Please follow me. In your first experiment you started in by taking 9½ grams of the base?

A. I did.

XQ. 579. How much did you take in your second experiment?

A. In my second experiment I divided my base into four portions.

XQ. 580. Of how much each?

A. In each part I used two grams of base.

XQ. 581. That is sufficient. Let us stop there. In the first experiment you dissolved it in 284 cubic centimeters of methyl alcohol non-acidic plus 50 cubic centimeters of methyl alcohol and hydrochloric acid, did you not?

A. Yes.

XQ. 582. What did you do in your second experiment?

A. I dissolved 2 grams of the base in 7 cubic centimeters of the methyl alcohol hydrochloric acid.

XQ. 583. Stop there, please. In other words, having taken a little less than a quarter of the quantity of base that you took in your first experiment, you used only 7 cubic centimeters of methyl alcohol against 284 that you used in your first experiment?

A. That is true.

XQ. 584. Which is about one-fortieth, is it not?

A. I beg your pardon. You stopped me too soon.

XQ. 585. Did I?

A. In addition to the 7 cubic centimeters of alcohol hydrochloric acid, I used 8 cubic centimeters of methyl alcohol itself, making a total of 15 cubic centimeters.

XQ. 586. But in your first experiment you used 50 cubic centimeters of methyl alcohol, did you not?

A. Yes.

XQ. 587. What I am pointing out to you is, that the proportion between the methyl alcohol you used in

your first experiment and your second experiment vary as between one-fourth and one-fortieth approximately?

A. Yes. You asked me if I used the same method. I said I did. I did not say I used the same quantities.

XQ. 588. Oh, you misunderstood me.

A. You said—you asked me if I used the same method and I said I used the same method.

XQ. 589. But not the same quantities?

A. Not the same quantities. I did not say that.

XQ. 590. We will see how far you are right in your method.

THE COURT: I do not understand your fraction of one-fortieth, Mr. Kresel, because there are 9½ grams of base in the first experiment against 284. In the second he starts with only 2 grams of base and uses 7. So the first is almost five times the amount of base in the second experiment. So that I had assumed you would multiply the 7 cubic centimeters of methyl alcohol by 4¾.

MR. KRESEL: Or say 5.

THE COURT: That would be 35 as against 284, which could not be one-fortieth.

MR. KRESEL: I see your Honor's point.

THE COURT: It being more nearly one-ninth or one-tenth.

MR. KRESEL: Yes, it would be nearly one-tenth.

XQ. 591. Did you follow our figures there?

A. I think you are both in error, if I may say so. In the first experiment I used 9½ grams of base in 284 cubic centimeters of methyl alcohol and 50 cubic centimeters of methyl alcohol hydrochloric acid, making a total of 334 cubic centimeters of solution. In the second experiment I used 2 grams of base with 7 cubic centimeters of methyl alcohol hydrochloric acid and 8 cubic centimeters of methyl alcohol itself, making a

total of 15 cubic centimeters. Therefore 334 and 15 are the volumes to be compared.

XQ. 592. In other words, you used about 20 times as much of the mixture in your second experiment as you did in your first?

A. Yes, but I had less solid.

XQ. 593. That is right. And the proportion in solids was as between 5 and 2?

A. Approximately 5 and 1.

XQ. 594. In your first experiment you say that you shook this mixture with superfilter?

A. I did.

XQ. 595. What did you do in your second experiment? Or did you do that in your second experiment?

A. I have no record of it.

XQ. 596. That is all I am talking about—your record. In your first experiment you said that you poured this solution into 600 cubic centimeters of ether containing 3 per cent. of ethyl alcohol, keeping it in an ice bath. Do you remember that?

A. Yes.

XQ. 597. What did you do in your second experiment?

A. In my second experiment, I poured this solution into 150 cubic centimeters of anaesthesia ether.

XQ. 598. It says "ether," does it not?

A. It says an anaesthesia ether.

XQ. 599. Is that the same ether that you speak of in your first experiment?

A. That is only adding 1 per cent. of ethyl alcohol instead of 3 per cent.

XQ. 600. Omit the amount of ethyl alcohol there was in it, but looking only at the quantity for the moment, you had 600 cubic centimeters in your first experiment as against 150 in your second experiment?

A. I did.

XQ. 601. And in the first experiment you had four

times as much of the base as you have in your second experiment?

A. Yes.

XQ. 602. You kept the mixture in an ice bath in your second experiment?

A. I did.

XQ. 603. What did you do in your second experiment?

A. I kept it in an ice bath.

XQ. 604. Didn't you keep it at a temperature of from zero to 5 degrees?

A. That is the temperature which I obtained by using an ice bath.

XQ. 605. In other words, in an ice bath, you did not get zero?

A. If I had left it long enough——

XQ. 606. Did you get zero as you did in your first experiment?

A. Will you please ask me that question over again?

XQ. 607. Didn't you get your temperature down to zero in your second experiment?

A. I recall it was between zero and 5.

XQ. 508. In your first experiment you added 600 cubic centimeters of ether. What did you do in your second experiment?

A. You are referring to after I add the ethyl alcohol solution to the ether?

XQ. 609. Yes.

A. I did not need to add any more ether in this case.

XQ. 610. You did not add any more?

A. I didn't need to.

XQ. 611. Well, you didn't?

A. I didn't.

XQ. 612. In your first experiment you say nothing about stirring of the solution in order to produce a pre-

cipitate. In your second experiment you say that you stirred it in order to produce a precipitate and that you kept up the stirring for ten minutes. Do you find it?

A. In my second experiment I recall that I added a methyl alcohol solution during a period of five minutes and stirred the material ten minutes subsequently. In the first experiment I have the word "stirring" in my notes.

XQ. 613. How long did you stir it in the first experiment?

A. I did not record the time.

XQ. 614. In the first experiment you said that you dried it in vacuum over sulphuric acid?

A. I did.

XQ. 615. What did you do in your second experiment?

A. I have not recorded the process of drying—I beg your pardon; I dried this eighteen hours in vacuum over caustic soda.

XQ. 616. Eighteen hours?

A. Yes.

XQ. 617. That is the second experiment?

A. Yes.

XQ. 618. What yield did you get in your second experiment?

A. To what part of the process are you referring?

XQ. 619. I am referring to the arsphenamine.

A. I will have to calculate that for you. I obtained a 97.7 yield of arsphenamine base, using the process stipulated in the patent, and when I converted that into the hydrochloride, combining all four of these experiments in this division of my work, I obtained a 69.9 per cent. conversion of the base into the hydrochloride.

XQ. 620. In other words, taking it in round figures, 69.90; about 70, we will say?

A. Yes.

XQ. 621. 70 per cent. of what?

A. Of, to again use round figures, 98 per cent.

XQ. 622. Seventy per cent. of 98 is about 65 per cent.?

A. It would be a little bit more than that.

XQ. 623. How much more—66? To be exact, 68.6 per cent. was your yield of arsphenamine?

A. The yield of arsphenamine hydrochloride was 68.6 per cent.

XQ. 624. I notice that you said that you got your 97 per cent. by following the specifications in the patent. In view of your testimony this morning do you still persist in saying that your experiment followed exactly the outlines in the patent?

A. As I as a chemist interpreted them.

XQ. 625. The word "exact" and the word "outline" are not chemical terms. We are laymen here. Did you not understand, when Colonel Anderson asked you whether you followed specifically the outlines in the patent, that it meant just that and not what a chemist understands by that?

A. I gave my answer as a chemist; not as a layman.

XQ. 626. Then, Dr. Christiansen, it comes down to this, does it not: that as you sit there, you cannot swear that by strictly following the words of that patent anybody can make arsphenamine? Now just reflect on that.

MR. ANDERSON: If your Honor please, that is not the test, and I object to that question. It is not a question of anybody making arsphenamine; it is a question of whether one skilled in the art can make arsphenamine.

THE COURT: I had assumed that the question meant that.

MR. ANDERSON: I do not think he said so. He said "Anybody can make arsphenamine." I know I could not.

MR. KRESEL: Read me the question. I will modify it, your Honor. Strike out the question.

THE COURT: I think the question as now put includes those skilled in the art as well as any one else, and so it seems to me it is a broader question and a fairer question than it would be if more restricted. Will you not read it?

(XQ. 626 repeated as above recorded.)

THE COURT: I shall assume that "anybody" as there used means, if the answer is in the affirmative, that he is unable to swear that anyone, whether a skilled chemist or not, or one skilled in the art of chemistry, can make it.

MR. ANDERSON: If your Honor please, "anybody" includes everybody.

THE COURT: Yes. And he can say in answer to this question whether anyone can do it; that is, I assume that he will lay to one side those who are not skilled, and then answer, if it is true, a person skilled in the art can, but others cannot. So that the question thus gives him more latitude.

MR. ANDERSON: When thus interpreted it is possible the question is not subject to objection; but as I understood the question, it would mean whether anybody in the courtroom could make arsphenamine, and I know I could not.

THE COURT: The witness has now had the benefit of our discussion and he can say whether a layman, or a chemist, or an ordinary chemist, or a skilled chemist, can make it by strictly following the process or steps of the patent.

THE WITNESS: Everybody could not do it; but

a chemist with training who reads the patent and the literature to which I referred you on Friday, reflecting over the patent and carefully considering what steps he should do in his technique, could make arsphenamine according to the directions of the patent.

XQ. 627. Now, Dr. Christiansen, I do not want to quarrel with you.

A. I do not want to quarrel with you, either.

XQ. 628. I am asking you simply about the patent. I have nothing to do with the literature nor the technique. I am asking you simply this: Do you now say that any chemist can take this patent and nothing else, and strictly follow the words of that patent and get arsphenamine?

MR. ANDERSON: I object again, if your Honor please. A chemist has a right to take all literature up to date of the issue or use of the patent, and read that literature, because that is matter on which chemists are supposed to be informed, and therefore a question which excludes from his consideration the literature on the subject, which he has defined he read, is not a question that is proper to be put to an expert on that subject.

THE COURT: But I have this difficulty, Colonel Anderson: I have no objection to the patent saying "Dry product at certain stages," if it does I have no objection to the patent simply saying to dry the product. Whether that is an intermediate or not, I do not recall, or whether it is the ultimate product of the patent; because I assume that to persons skilled in the art there may be half a dozen ways of drying it. That is all right.

But I do not understand that a person skilled in the art can follow the patent and yet change

the proportions of the patent. I do not understand that a person skilled in the art can change the fixed temperature of the patent, and use 50 degrees centigrade at one step, and 55 to 60 degrees centigrade at another. I do not understand that that is skill in the art; but as I understand it now, that is a deviation from the patent, and I am going to let him explain those things as fully as he likes, either before or after your redirect.

Now then, unless he has in some of his 1200 experiments followed the process of the patent, which, until my views are corrected, I shall assume he has not, the question makes the inquiry based on the assumption that he has not followed the process of the patent in these steps with respect to which he has been examined, and asks him whether, in view of his departures from the patent, he is able to testify whether a safe product may be produced by following strictly the steps and processes of the patent. Do I make myself clear, Mr. Knight?

MR. KNIGHT: Yes, your Honor. I only desire to call your Honor's attention to this: There has been a good deal said about following the terms of the patent. As a matter of fact, what the patent says is, "The procedure for preparing the new compounds may, for instance, be as follows," and then specific data are given as to proportions and ingredients and steps to be taken—as an instance.

THE COURT: Yes.

MR. KNIGHT: I only want to call attention to that. I think that the language of this should call attention in these inquiries or in the consideration of the Court to the fact that we are considering the specific instance.

THE COURT: For instance, is there anything in there about—we will just take the simple one, which will be easier for me to understand—the temperature. Is there anything to indicate that the person employing the process of the patent may depart from 50 degrees centigrade, for instance? I would rather have the record show, and the witness understand what I am talking about.

MR. KNIGHT: I assume your Honor is referring to the language at page 1, line 67 of the patent, which says, "On digesting the solution at 50 degrees Centigrade, a light-yellow micro-crystalline precipitate separates, which consists of diaminodioxyarsenobenzene." That states a result which can be arrived at with 50 degrees Centigrade.

THE COURT: If I understand, there is no latitude given to the person employing the process to go to 40 to 45, or 55 to 60.

MR. KNIGHT: No, but no specification that he is to use that. It simply says what happens when he does use that.

THE COURT: I think the objection is not well taken.

MR. KRESEL: (To witness) Would you like to have the question read, Doctor?

THE WITNESS: I would.

MR. KRESEL: Please read it.

(XQ. 628 repeated as above recorded.)

THE COURT: That question is broader than I thought from memory, Mr. Kresel. Those skilled in the art are entitled to start the experiment with such knowledge and information as a person with fair and ordinary skill in that art would have, and if a person with fair and ordinary skill in that art would be entitled to a review of the

literature existing at the time of the issuance of the patent, then your question does not help me, unless it is predicated upon such assumption.

XQ. 629. Will you answer my question? Assume the statement made by the Court and then answer it.

A. I believe that a skilled chemist, upon reading this patent and employing the technique which he considers appropriate and which is not stipulated in the patent, can obtain arsphenamine.

XQ. 630. Your experience showed you that you did have to depart in many particulars from the specifications in the patent, did it not?

A. In my quantities there are slight deviations from the patent, and I used a different temperature from what the patent requires, for specific reasons.

XQ. 631. I do not care what the reasons are. I assume you were trying to make the very best arsphenamine that you could obtain; right?

A. That is not the reason for the deviation in temperature.

XQ. 632. What was the reason?

A. Because you can obtain arsphenamine whether you operate at less than 55 degrees or more than 60 degrees, but the rate at which you obtain arsphenamine is a function of the temperature at which their action is carried out.

Thus, at a lower temperature it will take you ever so much longer to obtain your product than it will at a higher temperature, and it was with the object of slightly increasing the speed of reaction that I picked out a temperature of 55 to 60 instead of operating at 50 degrees. It was not in order to obtain a better arsphenamine. It was in order to save time.

XQ. 633. In order to save time?

A. Yes.

XQ. 634. Now please remember that. You did not do it in order to get a better arsphenamine?

A That was not my object at that point, no.

XQ. 635. You did not do it in order to get a less toxic arsphenamine?

A. I did not.

XQ. 636. You did not do it in order to get a non-poisonous arsphenamine?

A. I think you say "nonpoisonous" ill-advisedly.

XQ. 637. Well, non-toxic.

A. And "non-toxic" either.

XQ. 638. Also ill-advisedly?

A. Yes.

XQ. 639. An arsphenamine with a low toxicity?

A. With a comparatively low——

XQ. 640. You did not do it for that purpose?

A. No.

XQ. 641. You have done some writing on this subject, have you not?

A. I have, sir.

XQ. 642. And you published an article on: The Synthesis and Toxicity of Arsphenamine?

A. That is not the whole title of that paper, sir.

XQ. 643. The title is, "The Relation between the Mode of Synthesis and Toxicity of Arsphenamine and Related Compounds."

A. That is right.

XQ. 644. That is reported in Volume 43 of the Proceedings of the American Chemical Society Journal at Page 2202. I want to read to you a portion from that article. You were talking about the toxicity, pointing out the great importance of that. You said as follows:

> "That the toxicity of arsphenamine should be closely bound up with the reduction of the nitro group is not surprising when one considers the many intermediates and by-products encountered in the reduction of the nitro compounds."

In order that we may understand it here, when you speak of the reduction of the nitro compounds, you mean the reduction of the intermediate?

A. Didn't I say the nitro group, sir?

XQ. 645. Let me read it to you again. That is the best way. "That the toxicity of arsphenamine should be closely bound up with the reduction of the nitro group is not surprising when one considers the many intermediates and by-products encountered in the reduction of the nitro compounds." You use it both ways.

A. Did I say "of the nitro compounds" or "of nitro compounds?"

XQ. 646. "Nitro compounds."

A. Yes.

XQ. 647. Then you go on and say: "When the quantities of reagents used in this reduction were varied, no alterations were found in the toxicity of the resulting arsphenamine, but as soon as variations were made in the conditions under which the reaction took place, marked variations in toxicity were obtained" You said that, did you not?

A. I said that, sir.

XQ. 648. Now let us stop and consider what that means.

A. May I explain what I was referring to in that paper before I proceed?

XQ. 649. Just a minute, let me see if I can get it from you by question and answer, because then we will understand it.

A. All right, sir.

XQ. 650. As I read it, that means that when you came to reduce your nitro compounds or your nitro group, whichever you speak of, you used certain chemicals to get the reduction, did you not?

A. That is true.

XQ. 651. And you say that it did not make really

very much difference so far as the toxicity was concerned, as to whether you used a little more or a little less of those re-agents?

A. That is true.

XQ. 652. That is what you meant to say?

A. That is true.

XQ. 653. But you also said that the toxicity is affected when variations were made in the conditions under which the reaction takes place?

A. The conditions of the reduction of the nitro group.

XQ. 654. Yes.

A. The nitro group.

XQ. 655. Now, we will come to what you pointed out were the conditions I read again this: "but as soon as variations were made in the conditions under which the reaction took place, marked variations in toxicity were obtained. Ultimately it was determined that the important factors (bear this in mind, the important factors are) the degree to which high local concentrations of the nitro compound momentarily exist at the start of the reduction (2) the temperature at which the nitro group is reduced (3) the speed at which the solution, after the reduction of the nitro group is raised to 55 degrees." Therefore you wrote that the most important thing in getting a pure non-toxic product is the speed at which you do it, the temperature at which you do it, and the conditions under which you do it; and then you go on and say as follows: "The procedure best suited for the development of low toxicity is very vigorous mechanical stirring." Is there anything in the patent as to very vigorous mechanical stirring?

A. The patent does not stipulate anything about any conditions, any conditions.

XQ. 656. Now, listen. I want to read that again tc you: "The procedure best suited for the develop-

ment of low toxicity is very vigorous mechanical stirring, while a cold solution of the nitro compound is slowly added to a cold solution of magnesium chloride and sodium hydrosulphite, followed by rapid heating to 55 degrees." Is there anything of that sort in the patent?

A. I said the patent——

XQ. 657. Is there anything of that sort in the patent?

A. No.

XQ. 658. In other words, you say here over your signature that your experiments have shown that in order to get a non-toxic product or a product of low toxicity the most important thing is first to vigorously and mechanically stir the compound; second, that it must be a cold solution of the nitro compound; third, that it must be slowly added to a cold solution of magnesium chlorid and sodium hydro sulphid; fourth, that it must be followed by rapid heating and, fifth, that the heating must be to 55 degrees. Isn't that what you say?

A. That refers——

XQ. 659. Isn't that what you say?

A. In regard to the reduction of the nitro group.

XQ. 660. That is what I am talking about.

A. All right, yes.

XQ. 661. And you found that to be necessary after your experiments had been made?

A. I did.

XQ. 662. And you found that to be necessary in order to get a product of low toxicity; is that not right?

A. In order to obtain arsphenamine of a low toxicity, yes.

XQ. 663. That is what I am talking about. That is what you said here.

A. I just want to get it right.

XQ. 664. And you say none of those steps can you find described in the patent?

A. They are not described in the patent.

XQ. 665. And, not satisfied with that general statement, Dr. Christiansen, you have inserted in this article of yours a table?

A. I have.

XQ. 666. Showing that where you did what you say it was necessary to do—for instance, where you did rapidly stir and where you did slowly add, and where you did have it in a cold solution—you got an average of a tolerated dose of 118—look.

A. May I look, please?

XQ. 667. (Indicates to witness.) But where you did not rapidly stir, where you stirred slowly—do you see? (Indicating.)

A. Yes.

XQ. 668. And where you did not add slowly but added rapidly—you got a tolerated dose of only seventy-three.

A. That is true.

XQ. 669. There you are. You run between 73 and 118.

A. Yes.

XQ. 670. Now I want to ask you, Doctor, to take your papers and point out a single experiment wherein you exactly followed the outlines of the patent.

A. If you do not consider my first experiment as following the outline of the patent I cannot pick out any other.

XQ. 671. Doctor, when you write an article for your medical journal, you write in order to give the profession information that you have obtained?

A. I do.

XQ. 672. You do not write to tell them something they already know, do you?

A. I do not.

XQ. 673. Therefore, when you wrote this article from which I have quoted and pointed out these essential steps that are necessary in order to get a nontoxic product or a product of low toxicity, you regarded that you had discovered something that the profession had not known before, did you not?

A. I regarded that I had discovered the importance of the conditions of carrying out this reaction which the patent did not state.

XQ. 674. And which the profession up to that time as far as you knew did not know?

A. About which nothing had been published in the scientific literature.

XQ. 675. And you will notice, Doctor, that there are places in this patent where the inventor speaks of temperatures, where he considers that important; does he not?

A. He does not refer to the same temperatures to which I refer.

XQ. 676. But wait a minute. When the inventor considers that a reaction or a step is to be taken under this patent at a particular temperature he specifies it, does he not?

A. He specifies what he thinks is the best.

XQ. 677. Yes. Look, I point, for instance, to line 36 where he speaks of putting this sodium paraoxyphenylarsinate, dried at 80 degrees C.?

A. Yes.

XQ. 678. And where the patentee considers that the rapidity of stirring is important he specifies that. For instance, I read from line 38, where he says: "Into this mass a mixture of 39 ccm. of nitric acid (specific gravity 1.4) and 39 ccm. of concentrated sulphuric acid is poured by drops." You noticed that. But there is nothing in the patent which says that in order to get this product of a low toxicity you must stir it rapidly,

you must do it at 55 degrees, it must start cold, it has got to be done slowly when you put the nitro compound into the other, is there?

A. There is not, and——

XQ. 679. That is all I want to know, that is all I want to know. Doctor, had these elements which you found by your experiments to be necessary been contained in that patent, is it not true that it would not have been possible for a man learned in the art to have made arsphenamine of low toxicity?

A. To have made arsphenamine of a low toxicity it would——

XQ. 680. That is all I am asking.

A. Yes.

XQ. 681. You started experimenting, you told us, in September, 1919?

A. Not on arsphenamine. On the intermediates.

XQ. 682. You started making your intermediates in September, 1919?

A. I did.

XQ. 683. You started experimenting with arsphenamine in December, 1919?

A. I did.

XQ. 684. When did you publish your first paper?

A. My first paper?

XQ. 685. On arsphenamine.

A. In the fall of 1920, I think. I cannot state exactly.

XQ. 686. The paper from which I have read to you, published June 21st, 1921.

A. I think that is the third paper which I published.

XQ. 687. The first one was in the fall of 1920?

A. As close as I can recollect.

XQ. 688. Now everything that you have told us about your experiments refers to laboratory experiments, does it not?

A. All my knowledge is of laboratory experiment.

XQ. 689. That is, you did not carry any of your work into factory production?

A. Not personally.

XQ. 690. Did you see the tests made on the animals?

A. I have seen all the tests made on the animals.

XQ. 691. Every one of them?

A. Every one of them.

XQ. 692. Having had time to reflect, Doctor, how many experiments do you now say you really made on arsphenamine? You told us first 1200. Then apparently we misunderstood you and you meant something else. Then you said it was about 600?

A. Yes.

XQ. 693. What do you say now?

A. I still consider that I have made approximately 1200 experiments on arsphenamine. By that I do not mean that I have prepared arsphenamine 1200 times. On Friday you pressed me for an approximation of how many batches of arsphenamine itself I had made, and reluctantly I gave you an approximation, which I said was about 600.

XQ. 694. You may correct it now if you desire.

A. Since then I have given it no consideration, because I have no way of finding out how many experiments I did during the four years except by going through my notes.

XQ. 695. Well, you can do that?

A. I could do that.

XQ. 696. You said on Friday that it did not make any difference whether you started with a pure intermediate or an impure one, did you not?

A. I said my experiments showed I could start with the impure nitro acid which I obtained in the laboratory equally well as though I started with the nitro acid which I purified.

XQ. 697. And whether you started with a pure nitro acid or an impure one, did you get the same result?

A. Starting with the crude nitro acid, which I obtained in the laboratory——

XQ. 698. Now do not change to crude, let us stick to the pure and impure, won't you, please?

A. Yes.

XQ. 699. That is all I am talking about.

A. Yes. In the laboratory I have used pure nitro acid which I obtained by re-crystallization——

XQ. 700. I am not asking you that. Now, please stick to the question. Listen to it. Did you obtain the same result when you used pure nitro acid as you did when you used impure nitro acid?

THE COURT: You mean generally, or with respect to toxicity?

MR. KRESEL: I was asking him generally.

A. In using a pure nitro acid, and what I had been considering my impure nitro acid in my laboratory, I obtained the same results.

XQ. 701. All right. In other words, you got a product with as low toxicity when you used an impure intermediate, as you did when you used a pure intermediate; is that your answer?

A. To the best of my recollection.

XQ. 702. And yet in your article here, in summing up your investigations, you say this, I read to you from your summary at page 2210, third paragraph: "For the consistent production of arsphenamine of the lowest toxicity, it is advisable to use pure 3-amino 4-hydroxyphenylarsinic acid as the starting material."

A. We are not talking about the amino compound, Mr. Kresel. We are talking about the nitro compound.

XQ. 703. Did I ask you about any particular com-

pound on Friday? Did I not ask you whether you had to use a pure intermediate, and didn't you say it did not make any difference?

A. At that time we were talking about this intermediate, the nitrohydroxy acid.

XQ. 704. What do you say now, is it or is it not necessary to have a pure intermediate in order to get a low toxicity?

A. Will you specify which intermediate you refer to?

XQ. 705. Any intermediate.

A. I will state, as I stated in that paper, that to obtain consistently the best arsphenamine of the lowest toxicity, it is advisable to start with pure 3-amino 4-hydroxyphenylarsinic acid, in referring to the nitro compound in the list.

XQ. 706. Well, is not that the intermediate you start with, this 3-amino 4-hydroxyphenylarsinic acid?

A. It is not.

XQ. 707. What is the first intermediate?

A. The first intermediate used in preparing arsphenamine is 3-nitro 4-hydroxyphenylarsinic acid.

By THE COURT:

Q. 708. And that is referred to in what line of the patent?

A. That is line 57.

By MR. KRESEL:

XQ. 709. And where is the other one mentioned, the 3-amino 4-hydroxyphenylarsinic acid?

A. It is not mentioned in this patent.

XQ. 710. Then you are talking about something that is not in the patent at all?

A. In my paper——

XQ. 711. Now listen to me, Dr. Christiansen. I do not want any misunderstanding with you about it. I asked you on Friday whether you could start with

an impure intermediate and get a good result, and you said you could. Now, do you still say so?

A. If you still refer to nitrohydroxy acid, I say so.

XQ. 712. In other words, you say that you can take an impure intermediate, which is the only one mentioned in this patent, and get a low toxic product?

A. An impure intermediate in the sense which I am using the word "impure," yes.

XQ. 713. Let us understand. What do you mean by "impure"?

A. All right. I am glad you gave me a chance to explain.

XQ. 714. I am very glad to give it to you.

A. In the first part of this patent, the directions for the nitration of sodium parahydroxyphenylarsinate are described in detail. When that process is carried out——

XQ. 715. Pardon me. What is described?

A. The nitration of sodium para hydroxyhphenylarsinate.

By The Court:

Q. 716. At what line?

A. Starting with line 35 and continuing to line 49.

By Mr. Kressel:

XQ. 717. Is that the preparation of the nitro-oxyphenylarsinic acid which you say is mentioned in line 57?

A. Those are the directions for its preparation.

XQ. 718. Now, repeat that again, please, because I have lost the trend. You say there are directions for the preparation of this?

A. Yes, sir.

XQ. 719. Now, go on.

A. I am now describing what I mean by impure nitro acid.

XQ. 720. So I understand.

A. This compound is nitrated according to these directions and thereby we obtain nitrooxyphenylarsinic acid, as it is called in the patent, and that comes out from the reaction mixture in what is called by chemists the crude or impure form. In talking about material, the first result, the first material obtained from the reaction, is designated as "crude" in order to separate it from the purified material which is obtained by recrystallization of this first crude material. Have I explained that?

XQ. 721. You have gone as far, I suppose, as you want to go. Go ahead.

A. I want to be sure you understand me. Therefore, in speaking of impure nitrohydrooxy acid, I am referring to the material as it is obtained directly from the nitration; and in speaking of pure nitrohydroxy acid I am speaking of material obtained by re-crystallizing this first impure or crude product.

XQ. 722. I must confess I cannot follow you. But let me put this question to you. Whatever you mean by "impurity," do you say that starting with that impurity, you can purify the final product?

A. I did not state that. I say that you——

XQ. 723. That is all. Then you do say that if you start with an impure product, you cannot finally purify the final product?

A. The final product cannot be purified anyway, whether you start with pure or impure material.

XQ. 724. But if you start with a pure material, you do not have to purify the final product, do you?

A. No matter; if you start with pure material, your arsphenamine is not pure anyway.

XQ. 725. If you start with a pure material, the toxicity is low, is it not? You have said so.

A. I say if you start with pure amino compound, you obtain the lowest toxicity.

XQ. 726. That is an entirely different procedure, you tell me. The amino compound is not specified in the patent at all.

A. I know that.

XQ. 727. Then you are not talking about anything in the patent?

A. My paper does not have to be entirely about the patent.

XQ. 728. I understand that. Of course it does not. But insofar as the patent is concerned—and this is the last question I am going to put on this—you say that you can take an impure nitroxyphenylarsinic acid and get perfectly good arsphenamine out of it?

A. As I have——

XQ. 729. Yes or no, please.

A. I want to explain my "yes."

XQ. 730. Say yes or no, and then explain.

A. Yes.

XQ. 731. Now, do you want to explain?

A. I do.

XQ. 732. Go ahead.

A. As I have used the words "pure" and "impure" and explained them to you just a few minutes ago, it is possible to obtain arsphenamine which will pass the United States Public Health Service standards from the impure nitrohydroxy acid.

XQ. 733. Is it possible to obtain arsphenamine which will pass at 100 milligrams by using the impure nitroxyphenylarsinic acid?

A. As I have used the word "impure," it is.

By THE COURT:

Q. 734. Can you use the product of the steps specified in the patent and stop there and still get arsphenamine that will pass the 100-milligram test?

A. You were asking me if I take the nitrohydroxy

acid obtained by this patent, without purifying it, if I can get arsphenamine.

Q. 734a. Yes.

A. Yes, you can.

By Mr. Kresel:

XQ. 735. Please examine your notes and make sure that I have returned to you all of them. (No answer.)

XQ. 736. I assume, and if I am incorrect, you may say so, that you can get the good arsphenamine, which will pass at 100 milligrams per kilo, even though you use the impure nitroxyphenylarsinic acid, provided you observe the essential steps in the reduction that you have outlined in your article which I read to you, is that it?

A. Would you kindly repeat what you said, please?

(XQ. 736 repeated as above recorded.)

A. Using impure nitrohydroxy acid in the sense in which I have described the use of that word——

The Court: That is not the question you were asked. Won't you repeat it, please?

(XQ. 736 again repeated as above recorded.)

The Court: I will ask you, Mr. Kresel, to reframe your question so that I may know whether you are inquiring with respect to the product which is the result of the steps in lines 18-47 of the patent or whether you mean the impure product which he has referred to as having been in a measure purified by the recrystallization. Your question is open to some uncertainty.

XQ. 737. Doctor, you have testified that it is possible to obtain arsphenamine which will pass the test at 100 milligrams per kilo by using an impure nitroxyphenylarsinic acid mentioned in line 57 of the patent, and my question is whether in order to get that result,

with the use of such an impure nitroxyphenylarsinic acid, it is necessary to observe the steps with reference to the reduction of the nitro compound described in your article.

THE COURT: I do not understand your question, Mr. Kresel, which is unusual, I think, when you put them. But I have had this difficulty, Mr. Kresel. The witness has said that he can get an ultimate product of arsphenamine which would pass the test if he uses the first intermediate mentioned in the patent without purification. Now then, he has indicated that the impure intermediate to which he has generally been referring is a crude that has been in a measure purified but not reduced to absolute purity. I do not understand whether your question refers to the product which is produced solely by the steps of the patent or whether you are referring to the product that has been purified in some degree by recrystallization or not. I do not know to which intermediate you are referring.

MR. KRESEL: I am going to put it both ways. I will have it answered both ways. I withdraw the last question.

XQ. 738. Dr. Christiansen, if you start with the nitro-oxyphenylarsinic acid, that has not been purified at all, understand?

A. As obtained by these directions.

XQ. 739. As obtained by the directions contained in lines 34 to 47 in the patent——

THE COURT: 49 is it not?

XQ. 739. (Continuing). ——line 49 in the patent, is it possible to get arsphenamine which will pass the test at 100 milligrams per kilo without observing these steps in the reduction of the nitro product, namely, that it should be "subjected to very vigorous mechanical stirring, while the cold solution of the nitro com-

pound is slowly added to a cold solution of magnesium chlorid and sodium hydrosulphite and then follow by rapid heating to 55 degrees."

A. Those conditions which I describe there should be varied to get a consistent production of arsphenamine which will pass the Public Health Service Standard.

THE COURT: Won't you repeat that question? I am interested in the answer to that question.

(Question repeated as recorded.)

XQ. 740. I think that can be answered yes or no. Say yes or no if you can.

A. It is not possible to obtain that product which will consistently pass the Public Health Standard test unless those conditions are followed.

XQ. 741. Can not you answer that categorically yes or no?

A. No.

XQ. 742. The answer is no, or the answer is that you cannot answer it?

A. May I ask to have the question repeated again.

(No XQ. 743.)

XQ. 744. Certainly.

THE COURT: You did not intend that as an answer to the main question or to the last question?

THE WITNESS: I intended to answer the main question, sir.

XQ. 745. Do you still want it re-read so that you can change your answer?

A. I would like to have it re-read.

(Question repeated as recorded.)

THE WITNESS: I say no, and may I explain my "no"?

XQ. 746. Yes.

A. Unless these conditions under which the nitro group is reduced are followed, it is not possible to con-

sistently obtain material which will pass the Public Health Service standard of 100 milligrams per kilo.

XQ. 747. If you use the nitro-oxyphenylarsinic acid prepared in acordance with the specifications in the patent, lines 34 to 49, which, when produced is purified as you have described, is it possible to produce therefrom arsphenamine which will pass the 100 milligram test without following the steps outlined in your article in the reduction of the nitro group, namely, that the substance should be subjected to very vigorous mechanical stirring while a cold solution of the nitro compound is slowly added to a cold solution of magnesium chlorid and sodium hydrosulphite and then followed by rapid heating to 55 degrees?

MR. ANDERSON: Would your Honor have that question read again? I cannot understand it.

THE COURT: Yes.

(XQ. 747. repeated as recorded.)

A. No, and I want to explain my answer. Even starting with purified nitrohydroxyphenylarsinic acid it is not possible to obtain an arsphenamine of low toxicity consistently unless the conditions which I have described in my paper are followed.

MR. KRESEL: That is all.

THE COURT: You may define what you mean by "consistently." You may make any explanation either now, or after your re-direct examination is closed that you desire, with respect to any answers that you have made to a question by Mr. Kresel.

RE-DIRECT EXAMINATION.

By MR. ANDERSON:

RDQ. 748. Speaking as a chemist, do you regard the conditions which you have described for the process of purification during the development of this

product as indicated from the nature of the experiment and the product to be produced?

MR. KRESEL: I object to that as grossly leading.

THE COURT: Sustained on that ground.

RDQ. 749. Can you state whether or not in your opinion, a chemist skilled in the art, would or would not regard the conditions which you have described as essential to the production of a pure article which will pass the Public Health test, as indicated by the nature of the process, the nature of the materials used and the purposes for which the product is intended?

MR. KRESEL: Do you mean the conditions that I read from his article, Colonel?

MR. ANDERSON: Yes, conditions necessary for purification. If you do not understand the question will you have it re-read?

THE COURT: I will be glad if you would.

(RDQ. 749. repeated by the Stenographer as recorded.)

THE COURT: You mean of course, a chemist who had the skill in the art at the time of the issuance of the patent, and not chemists of today; do you not, Colonel Anderson?

MR. ANDERSON: I mean such a chemist as he would get when he made the first experiment here.

THE COURT: You mean the time at which he issued his patent, Colonel Anderson, not now.

MR. KNIGHT: Is that the question? The question as I understand you is as to the value of these patents in April, 1919. The question does not arise as to the performance of the process before.

THE COURT: I see the point of your suggestion, and then, instead of the date of the issuance of the patent, let it be 1919; but what I was trying to get is the distinction between the skill of

a person today and the skill of a person at the crucial time, whether that be at the issuance of the patent, which it would be if the question of validity were involved.

MR. ANDERSON: I withdraw the question as it is a little involved at that point, and I will make it more specific.

RDQ. 750. When did you say, Doctor, that you made your first experiment in this manner?

A. My first experiment of arsphenamine was made on December 8, 1919.

RDQ. 751. Now then, I will ask you would you at that time, under the conditions then prevailing, have regarded the character of the ingredients used, the nature of the experiment or process and the purposes for which the product was to be used, as well as the nature of the product as indicating to a chemist skilled in the art, the precautions or steps of purification which you indicated in your answer to Mr. Kresel?

MR. KRESEL: If your Honor please, I am sorry that I do not know to what the question is directed. I want to know specifically whether it is directed to the steps outlined by Dr. Christiansen in the article that I read.

MR. ANDERSON: I have not the article before me, so I can not follow the language used by Doctor Christiansen.

MR. KRESEL: Here it is, right there, beginning there (handing paper).

THE COURT: Will you reframe your question or stand on the one you have put?

MR. ANDERSON: I will reframe it then.

RDQ. 752. I will put it this way: In your article of June 21, 1921, to which counsel for the defendant has referred, there appears this language which he read to you: "The procedure best suited for the development of low toxicity is very vigorous mechanical

stirring, while a cold solution of nitro compound is slowly added to a cold solution of magnesium chloride and sodium hydrosulphite followed by rapid heating to 55 degrees." I ask you whether at the time that you used that method as shown by the notes which you have read, you were of the opinion as a chemist that taking into consideration the nature of the process, the character of ingredients used and the character of the product and the use to which it is put when injected into human veins, would you or would you not say that the procedure indicated by you for the purification of this product for producing a low degree of toxicity, which is the same thing, would be indicated to any one skilled in the art, in the then condition of the literature on the subject?

MR. KREBEL: Your Honor, I am sorry, I do not want to object, and yet I think we should have a question which all of us will understand the bearing of. I do not think this does. It speaks of purification to which the extract from the article is not directed. It speaks of conditions which are not described. I do not think that anybody could be helped by an answer to this question.

MR. ANDERSON: If your Honor please——

THE COURT: I am going to overrule that objection and I think I would rather have the answer. I want the answer to that question.

MR. ANDERSON: If it is confusing to you in the question, please have the Stenographer read the question.

A. I think I understand that. I believe that a person skilled in the art and having knowledge of the chemistry of arsenicals in general would, taking the quantities given in the patent, follow approximately the procedure which I have indicated as being most favorable, but I doubt if he would be able the first time to pick out exactly those conditions which I have

outlined in my paper. He would be able to approximate them, but not pick them out exactly.

THE COURT: You mean the combination of conditions?

THE WITNESS: The combination of conditions, sir.

RDQ. 753. You state, Doctor, the procedure best suited for the development of low toxicity as that indicated in your paper. If those conditions were approximated, would or would you not say that a condition of satisfactory toxicity would be produced?

MR. KRESEL: What conditions were approximated?

MR. ANDERSON: The conditions which I read to him in this paper, and which he said any one would approximate.

MR. KRESEL: How can you approximate very vigorous stirring? How can you approximate 55 degrees C.? I do not understand that.

THE COURT: May the question be read and the answer be given?

MR. KRESEL: All right, your Honor.

(RDQ. 753. repeated by the Stenographer as recorded.)

A. If those conditions are approximated, the product, although not being tolerated in maximum doses would, in all probability pass the Public Health Service standards.

RDQ. 754. Of 100 milligrams?

A. Of 100 milligrams per kilo.

RDQ. 755. Did you, in fact, in your experiments, as shown by your notes which I have not before me, vary the procedure which you outlined here, as what you think is best? Do you want to see what you said? You have a right to look at the paper.

A. I know know those conditions, Colonel. In my

research I have varied those conditions over a wide range.

THE COURT: That does not answer your question. Do you want it restated?

MR. ANDERSON: No, sir. I will ask another one.

RDQ. 756. Will you take your notes which you have before you of your various experiments and indicate if you can do so, the extent of the variation of the procedure which you outline in your paper in relation to the reduction of toxicity? If I do not make any question clear, please say so, because I am not a chemist. If you can take your notes, indicate the extent of the variation either way from the procedure outlined.

THE COURT: That is very clear, but I assume that each experiment was based on a different combination of conditions; that is, some of the conditions may have remained stable, while other ones changed. It seems to me he would have to put straight all the facts disclosed by his notes in order to give that.

MR. ANDERSON: If he will take his notes where he varied to any degree the procedure indicated, I will ask him to state all the facts and explain what are their relations to each other.

THE COURT: I will let you have the answer, but the answer will not mean a single thing to me for this reason: The witness has indicated that he believes the first experiment strictly followed the patent. Now then, if he is going to make his answer on that assumption, then his answer is uncertain in effect so far as I am concerned, because I think he will have to get right down to the facts that he used, rather than to his opinion as to whether it was a departure from the patent.

MR. KNIGHT: The particular remark, your

Honor, which the counsel for the defendant has referred to so much in his cross-examination, is not in the patent, it is in this article, and the article states, as you might say, the epitome, the final result of a great series of things.

THE COURT: Yes.

MR. KNIGHT: Not of the final experiment, but a great many experiments.

THE COURT: Yes.

MR. KNIGHT: I do not think we can get the meaning of this with relation to the patent, if I may say so, without considering at least generally what variations he made.

THE COURT: In what? Variations he made in what?

MR. KNIGHT: In the conditions which are referred to in this article.

THE COURT: I recall the article very clearly. Well, you may take the answer to the question. Read it, Mr. Smart, please.

MR. KNIGHT: This may not be just the question to bring out the point I am after.

(RDQ. 756. read as above recorded.)

A. I have varied the temperature from eight degrees to thirty degrees at the time of reduction of the nitro group. Those are the limits of variation of the temperature. I have varied the rate of agitation or stirring from a very slow rate to a very high rate of stirring of the solution. I have varied the time which is occupied in adding the nitro solution to the hydrosulphite, from approximately five seconds to a minute and half. I have varied the time required to bring those solutions, from the initial temperature of the reaction to 55 degrees, from I think seven minutes to thirty or forty minutes. I believe those are the conditions which I stipulate in that paper of mine.

By Mr. Knight:

RDQ. 757. I note on page 2205 of this publication which contains your article, the American Chemical Society Journal, a table showing the influence of conditions of preparation on toxicity.

Mr. Kresel: Is this a question, or what is it? Is this a question to the witness?

Mr. Knight: Yes.

Mr. Kresel: I am sorry. I did not understand it.

RDQ. 757. (Continued.) Please look at this table and for the purpose of the layman and also the chemist explain the relation that has to the explanation of the result stated in the matter that has been quoted from your article.

Mr. Kresel: Mr. Knight, you will pardon, me, but I do not quite understand what you mean by asking what relation it has. I have no objection to putting the table in. I have no objection to having him explain it if you think it needs explanation. I have already asked him a question or two about that very table. Suppose you put it in evidence.

Mr. Knight: This table, as I understand, gives the variations of results more exactly than is expressed more generally in the first statement.

Mr. Kresel: Then let us put it in.

Mr. Knight: I want him to say what relation that has and to explain it so a layman can understand it, that is all. That table does not convey any meaning to me and I do not know whether it would to your Honor.

The Court: I would be glad to get any help that I could from you, but do you want to put the table in or not?

Mr. Knight: I think it should go in. I think

it should be here read into the question on the record.

THE COURT: Do you want the whole article in?

MR. ANDERSON: Have you a copy of this paper?

THE WITNESS: I have a copy of this paper.

MR. KNIGHT: I suggest that the whole article be offered in evidence now.

MR. KRESEL: No objection, sir.

THE COURT: Admitted.

MR. ANDERSON: Have you a copy of it, Mr. Christiansen?

THE WITNESS: It is in my room at the hotel.

MR. ANDERSON: We now offer in evidence article dated the 21st day of June, 1921, written by the witness and published in the American Chemical Journal of July-December, 1921, Volume 43, and will hand up later a reprint from that article to be substituted in place of the book, as Plaintiff's Exhibit No. 681.

Received in evidence and marked "Plaintiff's Exhibit No. 681." (Copy to be furnished.) (*See Exhibits, Vol. III, page 1733.*)

THE COURT: Is the last question withdrawn or do you press for an answer—as to the relation of that to something else? I do not recall the question.

MR. KNIGHT: I wanted him to explain the meaning of this table, that is all.

A. In this table I have recorded data showing the influence which the important conditions under which the nitro group is reduced play upon the toxicity of arsphenamine.

The first two conditions which were discovered were the rate of stirring the solutions at the time of the reduction of the nitro group and I find that with

rapid stirring the toxicity of the product is—the average is 110 milligrams per kilogram of rat; whereas with slow stirring the toxicity averages 73 milligrams per kilogram of rat.

The next condition which was discovered was the rate at which the nitro solution is added to the solution of hydrosulphite, and this condition was combined with the rate of stirring, by which I mean that with rapid stirring and with slow addition of the nitro acid, the tolerated dose of the product rose to 115 milligrams per kilo; whereas the tolerated dose of the more toxic product remained at 73 milligrams per kilo.

The next condition was the temperature. In these experiments the most favorable ones were made by a combination of the conditions of rapid stirring, slow addition of the nitro acid solution, and a temperature, which I have recrded here, of 10 degrees, and the average tolerated dose was found to be 118 milligrams per kilo, whereas in the experiments used to produce the less desirable product the conditions were a slow rate of stirring, a rapid reduction of the nitro group, and a temperature of 30 degrees, and the product was tolerated in doses of 79 milligrams per kilo.

Now, to explain—that is the average of a number of experiments. The limits of those tolerated doses were 60 milligrams as a lower limit and 90 milligrams as an upper limit, whereas in the toxic products obtained in the previous cases, the upper limits were 100 milligrams per kilo, showing that I had lowered the upper limit of the tolerated dose.

The final condition which I developed as being desirable was a rapid rate of heating of the solutions after the reduction of the nitro group, and this combination of conditions, namely, a rapid stirring at the time of reduction of the nitro group, a slow rate of addition of the nitro solution, having the temperature at 10 degrees and rapidly heating to 55 degrees, gave me an

average tolerated dose of 134 milligrams per kilogram of rat, the limits of those tolerated doses being 130 milligrams and 150 milligrams.

And in the opposite series of experiments, where I obtained a less desirable product, the solutions were stirred slowly, the nitro solution was added rapidly, the temperature was 30 degrees, and the combined solutions were heated slowly to 55 degrees. This product was only tolerated in doses of 55 milligrams per kilo, and the limits of this tolerated dose were, the lower limit 50 milligrams, and the upper limit 60 milligrams per kilo.

In that table I have recorded experiments made from impure nitro acid, as I have used the word "impure," and from recrystallized nitro acid, which corresponds with what I call pure nitro acid. Also experiments are included in that table in which the nitro acid was obtained by different methods. There are three different methods of obtaining this compound, and I have included results in which the nitro acid was obtained by each one.

The experiments include those in which sodium hydrosulphite, which is a commercial product, was obtained from different commercial houses, and different methods of conversion of the base into the dihydrochloride.

RDQ. 758. Mr. Christiansen, arsphenamine is inherently a toxic, is it not, or arsinic compound?

MR. KRESEL: Is it arsinic or arsinic compound you are talking of?

MR. ANDERSON: I will put it this way:

RDQ. 759. Arsphenamine is an arsinic compound and is inherently toxic, is it not?

A. Arsphenamine must have a certain toxicity. Every drug must.

RDQ. 760. I will ask you to take this patent No. 986,148, follow it from the first line of the process to

the last, take your notes of your first experiment before you and compare them with the detailed process in the patent. If the notes are not complete, fill in the facts as you recall them; state the exact variation in each case, if any, and the reason therefore in your own language.

MR. KRESEL: If your Honor please, this seems to me to be duplicating something that has already been done. The witness has already pointed out the differences between the note of his first experiment and the steps outlined in the patent. As to his reasons, I object thereto. We are not bound by his reasons, in view of his direct testimony that he got the result that he said he obtained by following exactly the outlines of the patent.

MR. ANDERSON: May it please the Court, in every instance I have noted here, in which he undertook to add to the specific answer an explanation, he was told he could not explain and that he could do it on re-direct. This gentleman is a scientist and I think he is entitled to take his paper, say why he did it, what he did and why he did it, if there is a variation, and let your Honor determine whether it is a valid reason for variation or a material variation.

MR. KRESEL: The difficulty is that that is not what we are trying here. The question that this witness undertook to answer on his direct was specifically that he got the result by following the patent. If it is made to appear by his testimony that he did not follow the patent, this does not answer it. As to the reason why he did not follow it or what his result was otherwise, it seems to me that is immaterial.

MR. ANDERSON: The question of whether he

followed the patent is a conclusion. This witness can take the patent and tell what he did.

THE COURT: I do not think it is a conclusion. I do not think it is any conclusion to say that he followed the patent. When the patent says one thing and he does another, I do not think that is a conclusion. But I am going to let him answer and make any explanation, give any reasons that moved him to take the steps that he did in following the patent or in departing from the patent; and when he gets through I am going to ask him—or he can answer it now—why he did not follow, with respect to the quantity of ingredients and temperatures, the exact figures of the patent, or the fixed proportions of the amounts specified in the patent, and why in each of these experiments he departed in smaller or greater degree, because there is sometimes a very small change which makes a big difference in result I have found. I concede, Mr. Kresel, that "why" may not have any bearing at all but I am going to let him explain that to see whether it will throw any light on the interpretation of the patent, for instance. I do not suppose it will, but I am going to see if it will.

MR. ANDERSON: Your Honor has stated exactly what my question was intended to bring out. If it had not been brought out on the first answer, I would have brought it by another question.

THE COURT: I am interested in your changes in the proportion of ingredients of the ultimate arsphenamine; and in answer to this question, you can tell me why you made those changes and used different proportions or different percentages of the different ingredients as you went along in your different experiments instead of following the fixed figures of the patent. I would be glad to have you do that, because I do not understand it now.

A. The patent states that in dissolving the nitro-hydroxy acid prior to its reduction, it shall be dissolved in a definite amount of water, to which a definite amount of sodium hydroxide at twice the normal strength is added. I did not use the exact procedure of the patent, but obtained the identical result for this reason: Instead of preparing 2-normal caustic soda, I calculated how much solid caustic soda would be necessary to obtain a 2-normal solution. As every chemist knows, commercial caustic soda is not an article of 100 per cent. purity. It cannot be. I assumed that it was approximately 91 per cent. purity and then used that much additional caustic soda; and instead of using a 2-normal solution, I used that weight of solid material and added to the amount of water prescribed by the patent the corresponding amount of water which would be required to dissolve that much solid caustic soda to prepare a 2-normal solution. That is the reason for the discrepancy between the amount of water which I used and the amount of water required by the patent. Every chemist can state that by the method which I used in dissolving my nitro acid and the method required by the patent—those two methods will lead to the same point in dissolving that nitro acid.

THE COURT: My difficulty is this: You started with a fractional portion of 32.9 in a preparation which would be represented by the fraction of 32.9 over 66. Why did you not carry that out with all of your ingredients?

A. (Continuing.) I was coming to that later, sir. I think that clears up the question about the volume of water and the use of solid caustic soda in this solution of 2-normal caustic soda.

The next item as I recall it is the quantity of sodium hydrosulphite which is used. Sodium hydrosulphite is a commercial material which from its nature

and from its method of preparation cannot be obtained in a pure form. The obtaining of hydrosulphite of over 99 per cent. purity is a very difficult problem and that material cannot be purchased on the market. The material on the market has varying degrees of purity. The patent does not state what the purity shall be.

As I recall my first work in 1919, I had found at some place in the literature figures stating the approximate purity of sodium hydrosulphite which was being currently used in Germany at the time this work was done. Then the sodium hydrosulphite which is obtained in this country—I do not know the exact purity of it—as I remember it, differed from the purity of sodium hydrosulphite which was recorded in the German literature and which is not recorded in the patent. And, in order to allow for that difference in purity and therefore in the amount of actual sodium hydrosulphite itself which is used, I used this different quantity of sodium hydrosulphite.

I think that is the best explanation I can give as to the difference in the quantity of sodium hydrosulphite used. The figure on magnesium hydrochloride I do not——

MR. KRESEL: Calculate exactly how much I could use. I wonder if I could have that.

MR. HERSHKOPF: 85½.

THE WITNESS: 85½ and I used 86½ grams. My magnesium chloridehexahydrate is a substance very difficult to handle in the laboratory. It has so much water that it forms a soup, and when that material was weighed out on a piece of paper it was very hard to transfer that quantitatively to the vessels in which I carried out my reaction. Therefore, I weighed out a slightly greater amount of magnesium chlorid on my balances on the piece of paper, and assumed that the amount which I took additional would be mechanically lost, and

therefore I would obtain in my reaction vessel the proper amount of magnesium chloridehexahydrate. It is due to the physical nature of that substance and the difficulty in handling it that I used a slightly different amount in weighing it out on my balances. Mr. Kresel calculated the figure of the amount of water I should have used. May I have that?

MR. KRESEL: Should have used 2137½ cubic centimeters; you used 2110.

THE WITNESS: Yes, sir. Now, my notes show that I used a smaller amount here. The difference there is very slight, and the difference in volume in that total reduction would, I am positive, have no effect upon the product. The difference of 27 cubic centimeters in a total bulk of over 2 liters would be a matter of small importance, and I think I can give the reason why I used a little bit less. That nitrohydroxy acid is contained, we will say, in a small glass flask. That is transferred to the reduction mixture containing magnesium chloride and hydrosulphite. In that process, it is absolutely—everyone will admit that in pouring that nitro solution out of the flask it is impossible to pour out every bit, that the walls of the flask will be coated with a film of that solution; so then in order to get quantitative transference of that material I rinsed it out with a little water, and I just assumed that perhaps I might use 27 cubic centimeters of water in washing that flask out. It is for that reason, I am very sure, that I used less water.

That explains, first, the discrepancy we find in making up the nitro solution. It explains why I used more hydrosulphite. It explains the very slight and insignificant total amount of water used. The next thing is the temperature at which

I carried out this reaction. The patent states 50 degrees and my notes show that I used 55 to 60 degrees. This reaction will proceed with the production of arsphenamine. Now I am not talking about the toxicity of the product and the patent states nothing about toxicity at all. It says you will obain a yellow powder. That reaction will give a yellow powder irrespective of the exact temperature at which the reaction is carried out.

By THE COURT:

Q. 761. Will it give a powder that it is safe to use on a human being?

A. Your Honor, the patent does not state anything about the use of this—about the toxicity of the product. It states you will get a yellow powder.

Q. 762. Of what use would it be if it is not for use on human beings?

A. It would be of no use, but then we must remember that years ago when this product was first prepared they did not obtain a product of as low toxicity as we obtain today. At that time the quality of the product was much lower than we obtain today, and the patent states that you get a yellow product, a yellow crystalline product, at 50 degrees.

Now I have shown if you carry that reaction out at lower than 50 degrees, you get a yellow product, if you carry it out at above 60 degrees you get a yellow product; but in every chemical reaction it is a known fact that the rapidity of that reaction is a function of the temperature at which you operate. If you operate, we will say, at 40 to 45 degrees instead of 50 degrees, your reaction will be that much slower. It may take a period of over three hours to arrive at complete reaction. If we take a range of temperature of from 60 to 65 degrees or 65 to 70 degrees, our reaction will proceed with much greater rapidity, and it was in

order to speed up this reaction, to obtain my product a little bit more rapidly in the laboratory, that I operated at 55 to 60 degrees. In subsequent notes, realizing that I had deviated from the patent to the extent, we will say, of an average of 7 degrees, I examined this factor and its importance in its relation to toxicity, and I could not find that operating at less than 50 degrees or above 60 degrees I obtained—I could not find that my product varied very markedly in toxicity, and the product which I obtained below 50 degrees and above 60 degrees was tolerated by animals in doses higher than those which were required of the original German product by the United States Public Health Service.

I have taken up now the difference in my method of preparation of my nitro solution, my quantity of hydrosulphite, my very slight deviation in quantity of magnesium chlorid, my deviation in quantity of water, the reasons and the effect of the slight variation in temperature, and now we come to the next point.

Mr. Kresel pointed out that I washed my product with water in the first case; in water containing carbon dioxide in the second case; and the patent does not require that you wash the product with water.

Q. 764. What does the patent say?

A. The patent says it should be filtered and dried. I have got the patent here, your Honor.

Now, any chemist who is preparing a product and has to filter a solid out of a solution containing inorganic or other materials which he does not desire in his product will absolutely wash his product with some solvent in order to get out the impurities. If he does not wash that with water, he will leave a film over each particle of his product, which contains in solution the other materials which are dissolved in that reaction mixture.

When he dries it the water disappears and the

impurities are left on the product whch he desires. Therefore I washed that product with water in order to remove the undesired products, and that is a thing which every chemist would do. It is unnecessary to state such a thing as that in the patent, because—now, for instance, when I was teaching in college, if my student did not wash his product with water, why, we thought he was a very poor student indeed. Every student, even a sophmore, in college, should know enough in filtering out his product to wash it with water. It is unnecessary to state in an article to a scientific man that he should wash his product with water or some solvent. Now, that is my reason for using water.

In the second case, I state that I used water in which carbon dioxide was dissolved, and I will give the reason for doing that. We know that arsphenamine is a substance which undergoes oxidation by the atmosphere, and also we know that water has a certain amount of air dissolved in it. Now, my precaution at this point was entirely unnecessary, but I will give my reason for doing it. In order to remove the oxygen and the air which was dissolved in the water, I passed carbon dioxide through it, and thereby the water saturated with carbon dioxide would gradually remove the oxygen by—the oxygen would partially go into the bubbles of carbon dioxide and disappear, and what is more, carbon dioxide has no oxidizing action in itself, and therefore could not by any means produce the impurity—the oxidation which might lead to a high toxicity of my product. That is my reason for using that.

It was in order to safeguard myself and avoid oxidation at that point, that I used carbon dioxide water. That was entirely unnecessary and in subsequent experiments I have not done so. That explains my washing of the product and my use of carbon dioxide.

Now we come to the next point. The patent says

"Dry"—dry the product. Well, as your Honor said, there are many ways of drying a product. We could heat it; we could blow air over it; we could let it stand in the air; or we can dry it in vacuum at room temperature, or at a higher temperature; or we can dry it over a dehydrating agent. Here we have a product which is a yellow powder, and which may oxidize, and which upon oxidation is known to give a substance which is more poisonous, more toxic, than arsphenamine itself.

Q. 765. When did that become known?

A. Ehrlich, in working with arsphenamine, states that we should avoid the formation of 3-amino-4-hydroxyphenylarsenious oxide, because that substance is much more toxic than arsphenamine itself, and that is known to be an oxidation product of arsphenamine. Therefore, we must avoid that formation.

If you leave this product out in the air, which contains approximately 20 per cent nitrogen, we would always expect that product to undergo oxidation with a possibility of formation of that poisonous substance. Therefore, everybody would know, or every chemist should know that that product would necessarily be dried in vacuum to keep away the oxygen of the air, or heat driving inert gas—you might drive in nitrogen; that would be perfectly possible, but it would not be feasible in the laboratory. Therefore, we must dry it in vacuum, and I said, over caustic soda.

If you just take a product which is wet with water, saturated with water, and put it in a vacuum desiccator, and evacuate it, and let the water gradually evaporate from that surface, it is a very slow process and it would take a long time to dry the product. But if, in the bottom of that container in which I am carrying out the drying, I put a dehydrating agent, that dehydrating agent will pick up the water as it evaporates from the solid, and hold it very tightly,

therefore accelerating my degree of drying—my rapidity of drying.

It enables me to work faster. It is just a process of acceleration. I state in my notes "forty-four hours." The patent does not state forty-four hours. It says, dry it. Well, we would have to dry it until it is dry, that is all there is to it, and I do not remember why I picked out forty-four hours. Maybe I was away for one day in the laboratory, or some reason. At the end of forty-four hours my product was dried. It was probably dry before that. It may not have been dry before that. That is an entirely unessential matter. The patent says to dry it and I dried it, and I stated the time which I dried it.

If, in my notes, I just said "dried," Mr. Kresel could have found no objections. All I have done is to make it more complete and show how I dried it. I stated in my direct testimony that following the directions of the patent I obtained a 90 per cent. yield. The patent gives directions for the preparation of arsphenamine base. It does not say—it does not specify conversion of that into the hydrochloride. Therefore, in testifying I said that I obtained 90 per cent. yield of the reaction that is described in the patent, and in my notes I have an 89.6 per cent. yield of the arsphenamine base, and that is the substance which is described in these detailed directions in the patent.

Q. 766. And claimed?

A. And not claimed, your Honor. There is no yield claimed in the patent.

Q. 767. But what is the product claimed? Is it the base or the hydrochloride?

A. "As a new product, diaminodioxyarsenobenzene"—arsphenamine base. It does not say arsphenamine, but that is the arsphenamine base—"being a yellow powder, insoluble in water, alcohol, ether and benzene, readily dissolving in caustic soda lye and di-

lute hydrochlorid acid, and decomposing when heated to about 165° C.; said product being in the form of its dihydrochlorid, a light yellow powder, readily soluble——"

By Mr. Kresel:

RXQ. 768. That is the arsphenamine, is it not—the dihydrochlorid?

A. Yes, arsphenamine is the dihydrochlorid; but he stipulates as a new product diaminodioxyarsenobenzene. He says that is his new product. His words say so.

RXQ. 769. But he says it is in the form of dihydrochlorid?

A. "Said product being in the form of its dihydrochlorid, a light yellow powder, readily soluble in water and methyl-alcohol, scarcely soluble in ethyl-alcohol, insoluble in ether or benzene; and decomposing when heated at about 190° C."

He states that his new product is the base, and he states in the form of a dihydrochlorid it has these definite properties.

Now, I obtained a 90 per cent. yield of what he says his new product is—his base. In his patent, he says this: "Its dihydrochlorid, which may be precipitated from a methyl-alcoholic solution by ether, is a light yellow powder." He does not say how it shall be done. A chemist reading that would say he dissolves his base in methyl-alcohol containing hydrochloric acid, and precipitates with ether.

Now, the chemist is given leeway indefinitely as to the amount of solvent he shall use, the technique which he shall use, the temperature at which he shall do it, and in every respect. He says it can be done. Therefore, no matter what conditions I use in precipitating my—in converting my arsphenamine base into the dihydrochlorid, I am within the limits of the pat-

ent. I am doing what he says can be done. He does not state how to do it.

I dissolve my base in methyl-alcohol containing hydrochloric acid, and I pour it into ether. Inasmuch as he does not say how it shall be done, what difference does it make how I do it That is entirely up to me. He gives no quantities here. In my first experiment I had to make a guess as to what I should use.

By THE COURT:

Q. 770. A guess with respect to what?

A. I had to decide for myself exactly the quantities of reagents I should use, my bulk of solutions, because he does not state what I should use. Therefore, in a review of such experiments, I made what I consider a poor guess. I dissolved 9½ grams of this material in 330 c.c.'s, a total of 334 c.c.'s of methyl-alcohol containing hydrochloric acid. That is the combined volume. I poured that material into two volumes of ether. Now, I possibly should have known that two volumes of ether would not be sufficient; but the fact is the patent does not state so and I did not know.

Q. 771. But were you or were you not skilled in the chemical art at that time?

A. Well, I do not want to state whether I was skilled or not. I admitted that I did not know that two volumes of ether was not sufficient. The patent does not say I should stir my ether. The patent does not state what kind of ether I should use. I used ether which I had in my laboratory, and it had approximately 3 per cent ethyl-alcohol in it. The patent does not say it should have 3 per cent ethyl-alcohol, and anybody who works with ether knows on account of its volatility that he should work in the cold; he should not keep it hot. It boils at 36 degrees.

Therefore, I put my ether in ice and water, which is a perfectly obvious thing to do.

And the patent does not say whether I should stir it or not. I did stir it, because I thought that was the proper thing to do in order that when I poured my ethyl-alcohol solution into my ether, I should not have all my ethyl-alcohol in one place and all my ether in another place. You want to mix them. That is obvious.

My notes say at first I got a precipitate which later dissolved. Well, as soon as I saw that dissolved, I knew that I had not enough ether in here, because the first introduction of methyl-alcohol, when there was a little methyl-alcohol and a whole lot of ether, precipitated my product. Therefore I added another 600 c.c.'s of ether which did throw my product out, which was to be expected. Everybody would know that would happen.

Here I had my yellow product of the arsphenamine hydrochlorid. That is to be filtered. He does not say it has to be filtered; but it has to be filtered; we know that, to get it out. And again I state that anybody in filtering a product will wash it with the solvent from which he is filtering it. I washed my product with ether. It is the thing that every chemist would do.

And here at this point we still have our product in an oxidizable form. It is not as oxidizable as the original product; but again we must dry it in vacuum to get out the air. I dried my product in vacuum over sulphuric acid. Sulphuric acid may be used in dehydrating, and I used it at this point because it does dissolve ether and aids the dehydration.

Now, I could perfectly well have dried this in a vacuum without any dehydration whatsoever, because ether is very volatile, and just by putting that product in a vacuum, just keeping my pump working on there,

the ether would disappear. I do not need any dehydrating agent.

In later experiments I used caustic soda, because concentrated sulphuric acid in a desiccator is a very disagreeable thing to use. It is a solid and in carrying your desiccator from one room to another you have to be very careful. Caustic soda being a solvent, you may handle your desiccator much more roughly and do not have to use such great care.

In that way I obtained this yellow powder, the dihydrochlorid, the procedure for which the patent does not describe the preparation.

Now, Mr. Kresel has taken up the fact that I only got a 67.6 per cent. conversion of the base into the hydrochlorid. Arsphenamine hydrochlorid, as precipitated from ether, is a slightly difficult substance to handle. You must use special technique. You have got to wash it rapidly, and so on, and if the air is terribly moist, the arsphenamine will pick up water and form a sort of a jelly thing. We have that trouble especially in hot weather. In the summer we have a great deal of difficulty in doing that. Therefore, you must work rapidly, and in working rapidly we all know we cannot scrape up the last little bit of stuff that is sticking around on a beaker or in a flask or on a filler. We must work rapidly and get it into the desiccator.

Therefore, our degree of mechanical loss is increased very greatly, and that is the reason for this low conversion.

Now, here I have my product. I have explained why and given my reasons, and my reasons are perfectly good for every deviation from this patent, and I have my product here which analyzed and obtained the Public Health—I have forgotten what the exact arsinic content required by the Public Health Service is —I obtained a product which analyzed for 30 to 45 per cent. arsinic.

The rats died at 130 milligrams per kilogram, and lived at 120 milligrams per kilogram. Now, the arsinic content of arsphenamine is always found lower than what you calculate it to be, for the reason that arsphenamine is always, when obtained by this process of reduction, no matter what conditions you use, if you use what I think to be the best conditions, is alway an impure product. There are sulphur compounds in it; there are oxygen derivatives. Now, there may be other products. Those products, especially the sulphur compound, having a higher molecular weight, will lower the arsinic content of the product, and that is why the arsinic content is usually lower than what it is calculated to be.

Now, your Honor, I have gone through my first experiment, giving you what I consider a very detailed account of all my reasons, and everything.

Now I would like to take up the subject of my second experiment.

THE COURT: I shall not go into that unless counsel on one side or the other goes into it.

THE WITNESS: I should like to.

MR. ANDERSON: I would like to give him a chance to do it.

THE WITNESS: I shall not go into this in detail. I will go into the conversion of the hydrochloride, the process which the patent does not stipulate and which I have developed for myself. I found I used an unnecessary large volume of methyl-alcohol. I used 334 c. c. per 9½ grams, and then I did not use enough stuff; but when a chemist is not given the exact directions for doing a thing, and he makes it the first time, he will not make the same mistake a second time. That would follow. So I took my product and dissolved it in less methyl-alcohol per gram, and used a larger quantity of ether, which all these things in my

first experiment indicated, and I did not find my difficulties. I did not have to add a second amount of ether to precipitate my base, because I had a large relation of ether—I mean precipitate my hydrochloride—I had my conditions more nearly exact; and I have found that using say one gram of base in a total of 7½ c. c. of methyl-alcohol solution, and precipitating with 10 volumes of ether, it is perfectly satisfactory. I do not know that in my first experiment anybody told me. I had to find out, and I incorporated that in my second experiment. That is the point I want to clear up in my second experiment, your Honor.

By Mr. Anderson:

RDQ. 772. What did you get in your second experiment in the way of yield and toxicity?

A. My second experiment gave me a 97.7 yield of arsphenamine base. The new product which is described in this patent, and for which the quantities are given, again I got 69.9 per cent. conversion which I say gave me considerable difficulty mechanically owing to the nature of arsphenamine itself and the toxicity, the toxicity of my first part. In this experiment, which I call experiment 2 in my whole series of work, I have it that at the time the animal lived at 130 milligrams per kilo. That is the only data which I have here. If the animal lived at 130 milligrams per kilo, we would certainly not expect any animals to die at 100 milligrams per kilo except when we get animals which are abnormal. It is a well-known fact that animals are like all human beings, and have their abnormalities. We cannot expect if we take ten rats, at 100 milligrams per kilo, that they are all going to live. As a matter of fact, some rats may be very defective; their lungs may be poor; or their intestines may be poor. We do not know from looking at them. Therefore, we might get an animal which lived at 130 milli-

grams per kilo, and we would not expect to get any at 100 per kilo unless we had normal animals.

RDQ. 773. Mr. Christiansen, can you recall any other respect in which you varied from or enlarged upon the Ehrlich patent No. 986,148?

A. In my detailed description of experiment 1, I have given every deviation which I can see from my notes and which I can recall from the patent.

THE COURT: In that experiment or all of them?

THE WITNESS: In this first experiment.

RDQ. 774. And that experiment is the first time you had ever undertaken to make arsphenamine?

A. It was the first arsphenamine I had ever seen.

RDQ. 775. Do you know whether arsphenamine or salvarsan is used upon other animals than rats?

A. Experimentally, we have used arsphenamine in toxicity determinations on other animals than rats, but I do not know much about the use on other animals except in that respect.

RDQ. 776. You spoke of Ehrlich having published some article with reference to the question of toxicity and accompanying impurities at one stage in your explanation of your first experiment. Do you recall your statement?

A. I do.

RDQ. 777. About when was that article published, do you know?

A. I cannot say. I remember reading it. I can probably find it in my reading notes, but I have not got it in my mind.

RDQ. 778. Was it before you carried on this experiment, do you know?

A. I had that knowledge before I carried on this experiment.

RDQ. 779. And you are sure you derived it from an article published by Ehrlich, is that true?

A. To the best of my knowledge I derived that from a paper published by Ehrlich.

RDQ. 780. Mr. Christiansen, if you can find that article when you return home, I would ask you to produce it, and I will ask leave to file it with the Clerk of the Court, and when we come back at another time, to file it in evidence, if I can do so. We have to close the case today.

THE COURT: Have you anything to say, Mr. Kresel?

MR. KRESEL: I should like to see it first, your Honor.

MR. ANDERSON: Of course. With that understanding, I will ask that you send it to Mr. Mahaffy, the Clerk of the Court, whose name you will get before you leave, please; and send to both Mr. Kresel and myself—if you send it to me, I will send it to Mr. Kresel—a reference to where the article is found, in what publication, and then we can look it up.

THE WITNESS: All I have on my reading notes The original publication and copies of it are not available for me and all I would be able to send you would be the reference. The Clerk would have to get a copy for the files in some other way. I cannot send a copy of the paper myself. It is not my personal property. All I have are my reading notes.

RDQ. 781. I will ask you to look at this bibliography on the subject of this paper published by Ehrlich and S. Harper in 1911 and see if you can identify that as the paper.

A. I have not read that paper. I did not read that paper because at the time I was interested in the chemistry of the product, and I considered from the title to this that it would not have a great deal

of chemistry in it. I was not interested in the pharmacology at the time.

RDQ. 782. After you go off the stand, I will ask you to look over this bibliography, and if you can, locate the paper to which you refer. I will try to get a copy before we adjourn. Something was asked you about digesting the product at a certain stage in the procedure, and the fact that no time was specified for such digesting process. Could you explain the term "digesting" in a chemical sense?

A. "Digesting" is a very indefinite term and it should be used more advisedly. "Digesting" would mean that the materials are brought to this condition and kept there. To give an example: suppose we want to boil some stuff up and keep it in a flask. We will say, "digest it." "Digest" might mean that you keep this material there with stirring or without stirring. We do not know.

RDQ. 783. What is the result of the digesting? Could you give me that?

A. The digesting produces a yellow powder. The patent does not state how long you shall digest it in order to get that yellow powder. That can be done very easily.

It is, of course, obvious that you want to digest it until the reaction is complete, in order to get as much of a yield as possible. To determine that, you just take out a small portion of your main reaction mixture and remove what yellow powder is formed, and then see if any more will form from the clear filtrate which you obtain from that yellow powder. That is a perfectly sensible and logical thing to do.

RDQ. 784. Have you among your notes any other experiments in which you follow closely the outline of this patent?

Mr. Kresel: That of course assumes that he did at any time.

THE COURT: I did not understand you, Mr. Kresel.

MR. KRESEL: I say that assumes that he followed it at any time.

THE COURT: He assumes he followed it at any time.

MR. KRESEL: Yes, sir. Your Honor will hear the question.

THE COURT: I understand the question.

A. I have in my notes experiments in which I have followed the patent as I have understood it and with the changes which I have given in my first experiment and which I gave reasons for, but which vary in this way: The patent does not state any experimental conditions. It says one solution shall be introduced into another. There are loads of ways of introducing solutions into one another; we may pour them together rapidly, we may pour them together slowly—they are introduced into each other just the same. Therefore, I have experiments in which I have varied these conditions and, therefore, conformed to the patent as closely as my first one does. They only differ in the experimental procedure, which is not specified by the patent.

RDQ. 785. In other words, you varied your conditions?

A. Yes, sir.

RDQ. 786. But followed the process in the patent, as you understood it?

A. Yes.

RDQ. 787. Did I understand you correctly to say whether, starting with the impure nitro compound, impure in the sense in which you use it, you can by the recognized purifying processes produce the high grade arsphenamine in the conclusion?

MR. KRESEL: He did not say that.

MR. ANDERSON: I so understood him. I h
a note to that effect.

A. The word "purifying" is not well used ther

RDQ. 788. What word do you want to use? T
can explain it any way you please.

A. The process under well recognized techniqu
there is no purification in this thing under the best
ditions.

MR. KRESEL: The what?

THE WITNESS: There is no purification p
ess recorded in this patent.

RDQ. 789. What did you do when you took w
you call the impure crude compound and started
and produced salvarsan or arsphenamine of a qua
which would pass the Public Health Service, as
stated?

A. I started with impure nitro-hydroxy acid—
pure in the sense which I have already explaine
used the quantities of reagents which I have recorde
my first experiment and which differ slightly from
patent, but as to which I give reasons, for making th
deviations—starting that way and using what I
sider the proper conditions for carrying out the r
tion. The arsphenamine so obtained will pass
United States Public Health Service requirement
100 milligrams per kilo.

THE COURT: I do not understand his ans
Do you want to clarify it? I do not know whe
he means the rapid stirring, the increased t
perature, or what.

RDQ. 790. You spoke of using the conditions
rounding the experiment or process which you thou
were satisfactory or desirable. To what condition
you refer?

A. I refer to the conditions which I have descri

in that paper. Now, if one uses the conditions which I have described in that paper, one obtains a tolerated dose well above the United States Public Health Service standard, but if one did not know those exact conditions and just approximated them, he might not obtain a tolerated dose of the highest degree, but he would obtain material which would pass the tolerated dose required by the Public Health Service, namely, 100 milligrams per kilo, because that is very easily obtained.

RDQ. 791. You mean it is easy to obtain a product arsphenamine or salvarsan, for one skilled in the art, by approximating the best conditions which you have undertaken to describe?

A. I do.

RDQ. 792. And you can do that using the intermediates and elements and otherwise following the process or formula described in the patent, under conditions which approximate good conditions or best conditions?

A. Yes.

MR. ANDERSON: I think that is all I want to ask Mr. Christiansen.

RE-CROSS-EXAMINATION.

By MR. KRESEL:

RXQ. 793. Dr. Christiansen, the conditions that you say are necessary to get a product of low toxicity, were conditions that you discovered?

MR. ANDERSON: If your Honor please, counsel went through that at the greatest length in cross-examination. He asked him that identical question. I have not brought out a thing on re-direct examination that was not in reply to cross. To go back now and go over this whole thing again, these complicated formulae, means that I will have to go back on re-direct, and if we are going to finish tonight we cannot do it, sir.

THE COURT: I recall exactly what his testimony was, Mr. Kresel, with respect to that—that he published this article for the medical art or science and that he was giving that information, which up to that time had not been disclosed to them. Is that what you wanted to bring out?

MR. KRESEL: Yes, sir.

RXQ. 794. You say that even though a person does not exactly follow the conditions that you discovered, but approximates them, he would get an arsphenamine that would pass the Public Health test at 100 milligrams?

A. I do.

MR. ANDERSON: I object. Well, your Honor, he has answered; but I do not think this is re-cross-examination, sir. We went over in the most extensive detail every possible process.

THE COURT: My difficulty with that, Colonel Anderson, is that if the table——

MR. KRESEL: I am coming to that table, your Honor.

THE COURT: No, I mean if the method of purification discovered by him and disclosed by him to the art was a good method and somebody who approximated that would get a satisfactory result, it seems to me that possibly those skilled in the art would have to know his method before they might be able to properly approximate his method.

MR. ANDERSON: But may I suggest to your Honor that a person skilled in the art would not have to know one method in order to follow a good method. It is all a matter of baking a cake, and one cook might do a little better than the other, but one would not have to go to look at the other cook to do it. It is just going over the same ground again.

THE COURT: I am not sure of that, Colonel Anderson. I allowed him to testify fully and without restriction, so I do not think I better close the door now.

RXQ. 795. It is apparent from the table contained in your article that when you did not observe those conditions you got a result very much lower than the 100 milligrams, did you not?

A. When I——

RXQ. 796. Well, didn't you?

A. When I did not even approximate them.

RXQ. 797. Now look. I show you your table. Look at your last experiment. When your rate of stirring was not rapid and your rate of addition of the nitro solution was rapid, and your rate of heating was slow, you got a fifty to sixty milligram result did you not?

A. I did.

RXQ. 798. When your rate of stirring was rapid but your rate of heating was slow——

A. Rate of addition was slow.

RXQ. 799. Rate of addition was slow and your rate of heating was rapid, all those conditions being what you discovered to be necessary, you got a result of 134 average, did you not?

A. I did.

RXQ. 800. That is the best that you obtained?

A. I did.

RXQ. 801. Then when you drop out the rate of stirring, instead of stirring rapidly you stir slowly and yet continue the addition rapidly, you got an average of 79?

A. Well, you are still combining the two conditions which I have in the last line.

RXQ. 802. Certainly.

A. Yes.

RXQ. 803. You got an average of 79?

A. Yes.

RXQ. 804. So that in order to get an average of 100 according to your table you had to have rapid stirring, slow addition, the proper temperature, and rapid heating?

A. To obtain 134, I had to have that—not 100.

RXQ. 805. Have you any example here where you obtain 100—an average of 100?

A. The closest I have is an average of 110.

RXQ. 806. Of 110. Now that example or that experiment wherein you obtained 110, you have nothing to show as to whether your condition was slow or upward, have you?

A. I have not.

RXQ. 807. You have nothing to show what temperature you used?

A. I have not.

RXQ. 808. So that that can hardly be taken as an example of what you are trying to show, can it?

A. I think it can.

RXQ. 809. You think it can?

A. I do.

RXQ. 810. Do you know whether you added slowly or rapidly there?

A. I can say as a chemist——

RXQ. 811. No, no. Not what you can say as a chemist. Do you know?

A. Those solutions we added fairly slow.

RXQ. 812. Why did you not put it down?

A. Because I could not give——I could not say that we did as slowly as in later experiments, but that we did fairly slowly.

RXQ. 813. Why did you not say so?

A. Because in each experiment, that factor not being understood, was variable. Therefore I did not put it down, and it did not——

RXQ. 814. Now, is not the reason that you did not put it down this, that you did not realize at the

time you were making your experiment, that it was of any importance?

A. It is.

RXQ. 815. That is the real reason, is it not?

A. I did not, yes.

RXQ. 816. In other words when you started experimenting you did not know that it was important as to whether you did it rapidly or slowly; whether you stirred the thing rapidly or slowly, or whether you had a particular kind or a particular degree of temperature?

A. I did not know those.

RXQ. 817. So that that was not anything that was generally known in the art at the time, was it?

A. One would not know those conditions were going to be so vital. He could not tell that.

MR. KRESEL: That is what I thought. That is all.

RE-DIRECT EXAMINATION.

By MR. ANDERSON:

RDQ. 818. You discovered it in the first experiment you made, didn't you?

A. I discovered that using the technique——

MR. KRESEL: No, no. Just answer the question. Did you discover it in the first experiment you made?

THE WITNESS: I did not discover the vital importance in the first experiment.

MR. KRESEL: That is what I thought.

RDQ. 819. How long did it take you to discover it?

A. I cannot say exactly.

RDQ. 820. Can you say approximately how many experiments you worked, before you saw the effect of those conditions?

A. It would necessitate that I look through here; it would necessitate that I look through these notes.

RDQ. 821. Just look through them.

A. It was after approximately 150 experiments in which I was examining a number of other factors than the conditions, that I began to examine the conditions, and I found it of vital importance. In the previous experiment I was examining a great many other factors and was not considering these conditions at all and that accounts for the large number of experiments required.

RDQ. 822. It was of vital importance to what?

MR. KRESEL: What is that?

MR. ANDERSON: He is speaking of "vital importance."

MR. KRESEL: I do not think that upon the re-direct this gentleman should be allowed to explain every word that he uses. "Vital importance" are two English words, and they are well understood. They have no technical meaning.

RDQ. 823. And they apply to a great many conditions here and I want to see what conditions he refers to.

THE COURT: You may take the answer.

A. I refer to the importance of the conditions under which the nitro group is reduced in its relation to the toxicity of the product.

RDQ. 824. And the fact is that on your first experiment you did follow those conditions?

MR. KRESEL: What conditions?

MR. ANDERSON: Those conditions which brought about the low toxicity.

A. I followed approximately the base conditions.

RDQ. 825. You did on your first experiment?

A. On my first experiment.

MR. KRESEL: Are you through?

MR. ANDERSON: I suppose I am, unles you reopen it, and I may have then something else to say.

RE-CROSS-EXAMINATION.

By MR. KRESEL:

RXQ. 826. You say you followed those conditions on your first experiment?

A. I say approximately, I did not say exactly.

RXQ. 827. Did you——

THE COURT: Mr. Kresel, I am wondering whether you can bring out anything that has not already been brought out. I am going to let you do it if you want to; but it seems to me you have in detail, in your first cross-examination the full facts, and he has testified about his third, about his drying, and temperatures, and all that; so I am wondering, whatever his conclusion is, as to whether he followed his table or not.

MR. KRESEL: That is the trouble, your Honor. He is allowed to give conclusions, when the facts are the other way.

THE COURT: He is allowed to give them, but I am not concerned with his conclusions.

MR. KRESEL: That is all. Any further question?

THE COURT: I want to ask one question.

By THE COURT:

Q. 829. Was nitroxyphenylarsinic acid a product that could be obtained on the market at the beginning of 1919, or at the end of 1919?

A. Not to my knowledge.

RXQ. 829. It was not then available?

A. Not to my knowledge.

THE COURT: I see.

RE-DIRECT EXAMINATION.

By MR. ANDERSON:

RDQ. 830. That brings up another question. Did you produce this acid yourself?

A. I did.

RDQ. 831. I note that there are certain proceed-

ings or formula indicated in this patent beginning a
line 33 and coming down to the period at line 49, whic
states that it formed a yellowish white crystalline pow
der. Now is this yellowish white crystalline powde
the acid referred to?

A. It is.

RDQ. 832. What did you do, Mr. Christiansen, i
producing that acid?

MR. KRESEL: You mean what steps he took?

MR. ANDERSON: What steps he took with th
patent.

A. I dissolved anhydrous sodium para-hydroxy
phenylarsinic and concentrated sulphuric acid, an
with vigorous stirring, maintained a temperature a
or below zero degree. I added slowly a mixture o
nitric and sulphuric acids, thereby what we call "ni
trating" the product. After the nitric acid and sul
phuric acid had been added, I allowed the tempera
ture to rise to 10 degrees, and poured this mixture
this nitrate mixture into a large volume of water, there
by precipitating the nitrohydroxyphenylarsinic acid
which I obtained as a yellowish white product. It is
very pale yellow compound. This material was filtered
out and washed, as everybody would do, and dried.

RDQ. 833. And what was the product then, wha
would you call your product?

A. That gives me what I call crude or impur
nitrohydroxyphenylarsinic acid.

RDQ. 834. Then after getting that you followe
the steps you have outlined and which need not be re
viewed?

A. I did.

RDQ. 835. Mr. Christiansen, before you leave th
stand, you have spoken of three different articles o
papers that you read, which you call the literatur
that you read. I would like you very much to get them
if you can do it here, or give us a reference to them
while we are here. If not, do it when you get back.

A. I can send you as soon as I get to Boston those references. That is the best I can do.

MR. ANDERSON: I think that is all.

MR. KRESEL: That is all.

July 20, 1923.

LOUIS FREEDMAN.

LOUIS FREEDMAN called as a witness on behalf of the plaintiff, in rebuttal, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. ANDERSON:

Q. 1. Please state your name and place of residence.

A. Louis Freedman, New York City.

Q. 2. And what is your profession?

A. Chemist.

Q. 3. State your education as a chemist; that is, schools from which you have graduated or which you attended, and your experience?

A. I graduated from Yale University in 1915 with the degree of Bachelor of Philosophy. Received the degree of Master of Science in 1917 also from Yale; and a degree of Doctor of Philosophy from Columbia in 1922. I was employed by the Calco Chemical Company from May, 1917, to September, 1919. During that interim, from the winter of 1918, I was in the employ of the United States Government on special research work on high explosives. From September, 1919, to the present time, I have been in the employ of the H. A. Metz Laboratories.

Q. 4. How long did you say you had been with the Calco Chemical Company?

A. Two years and four months.

Q. 5. Between what dates? Will you give it again? I did not get it.

A. May, 1917, to September, 1919.

Q. 6. While you were at the Calco Chemical Company, did you have occasion to undertake to produce or to experiment with the production of a drug called cinchophen?

A. I did.

Q. 7. I hand you Defendant's Exhibit No. 152, being a copy of United States Patent No. 1,075,171, issued October 7, 1913, and ask if in your work you have seen that patent?

A. Yes, sir; I have.

Q. 8. Did you work with the patent at all?

A. I did.

Q. 9. I will ask you, therefore, to take the patent and say what you did first?

MR. KRESEL: May the time be fixed, please?

Q. 10. State about the time that you made the experiments referred to in connection with the drug cinchophen?

A. I started on this to my best recollection around the middle of August, 1917, and I was instructed to make cinchophen according to this patent. I took the patent and I read it and I mixed the ingredients essentially as given in the patent; namely, mixing benzaldehyde, one molecular weight, with anilin oil, one molecular weight; condensing those two in the presence of denatured alcohol for two hours, two to three hours, and then adding to this mixture pyroracemic acid as given in the patent, and allowing this to boil for two to three hours longer.

The mixture obtained was then allowed to cool in an ice mixture or cold water sometime, when the substance obtained was crystallized out, it came out in the form of a solid. This material was then filtered by

means of suction and the semi-dry product obtained was further dried, either in the air or in a vacuum drier; and the substance was then purified by recrystallization from solvents.

Q. 11. What did you get?

A. I got cinchophen.

Q. 12. Was this done in the laboratory of the Calco Chemical Company?

A. My first experiments were done in the laboratory, yes, sir.

Q. 13. Where were your later experiments done?

A. In the plant. I would not call them experiments.

Q. 14. That was in commercial production?

A. Commercial production, yes.

Q. 15. When did the Calco Chemical Company begin to produce and market cinchophen?

A. In September; about the middle or the end of September.

Q. 16. What year?

A. 1917.

Q. 17. When did you leave the Calco Chemical Company?

A. The company itself, in general?

Q. 18. Yes.

A. September 1, 1919.

Q. 19. Was the Calco Chemical Company selling this product on the market in 1919?

A. In 1919, did you say?

Q. 20. Yes.

A. I do not think they were selling it on the market in 1919.

Q. 21. Did they sell it after 1917?

A. Yes, they did.

Q. 22. To whom, do you know?

A. Yes, I do.

Q. 23. To whom did they sell it?

A. To the firm of Schering & Glatz.

Q. 24. Do you know the character of the firm, its general business?

A. It is a firm dealing in pharmaceuticals.

Q. 25. Wholesale or retail?

A. Both, I think. I am not sure.

Q. 26. They began to market this product in the autumn of 1917?

A. Yes, sir.

Q. 27. Was the product which they marketed produced in the manner in which you have described?

MR. KRESEL: If he knows.

Q. 27 (continuing). If you know?

A. May I ask, who marketed?

Q. 28. I mean the Calco Chemical Company. Was the product which they sold produced in the manner which you have described?

A. Yes, sir.

Q. 29. You spoke of production in the plant. About how long after you began your experiments in the laboratory were they producing industrially in the plant?

A. About four to five weeks.

Q. 30. Did you work with anyone else in the production of this material in the manner which you have described under that patent?

MR. KRESEL: You mean in his experiments.

Q. 31. In your experiments, yes. Any other chemists?

A. No; not chemists.

Q. 32. Did you make these experiments for the Calco Chemical Company in the laboratory in which you developed this product, as you have indicated in your testimony?

A. I did.

Q. 33. You did personally.

A. Yes, sir.

Q. 34. Did you then go into the plant and apply

the results of that laboratory work in the industrial production of this drug?

MR. KRESEL: A leading question, but I will let it go.

A. I did.

Q. 35. It has been testified here by Dr. Crossley as to the cost of experimental work on cinchophen. Do you know when Dr. Crossley came with the Calco Chemical Company?

A. I know approximately.

Q. 36. When?

A. Either the end of 1917 or the beginning of 1918, I am not certain.

Q. 37. Can you state whether at that time the Calco Chemical Company was in fact producing cinchophen industrially and selling it to the merchants you have spoken about?

A. I can.

MR. KRESEL: Do you mean at the time——

MR. ANDERSON: That Dr. Crossley came.

Q. 38. You can so state?

A. I can.

Q. 39. Was it a fact that it was or was not?

A. It is a fact that it was.

Q. 40. You were engaged in the laboratory of the Calco Chemical Company during that entire period, were you?

MR. KRESEL: What period?

MR. ANDERSON: I mean the entire period of experimentation until the beginning of production of this material.

A. What was the beginning of that question.

Q. 41. During the entire period of experimentation and research?

A. Yes.

Q. 42. And during the entire period of the production of this material industrially?

A. I was engaged on it.

Q. 43. On this work?

A. Yes, sir.

Q. 44. It has been testified here that the Calco Chemical Company spent $60,000 in research work on cinchophen. Can you state whether that is a fact or not?

MR. KRESEL: If he knows anything about it.

THE WITNESS: I know.

Q. 45. Can you state whether they spent $60,000 in that work?

A. I am pretty sure that sum is considerably exaggerated.

MR. ANDERSON: The witness is with you, Mr. Kresel.

CROSS-EXAMINATION.

By MR. KRESEL:

XQ. 46. You know Dr. Crossley, I assume?

A. I do.

XQ. 47. You regard him as a man of character?

A. I do.

XQ. 48. And as a man of some prominence in the scientific world?

A. I do.

XQ. 49. You understand that it was he that testified that the Calco Chemical Company spent about $60,000 in experimenting with cinchophen, do you not?

A. Yes, sir.

XQ. 50. And you understand that your testimony here, the last answer to the last question, was that the amount was exaggerated—$60,000?

A. So I think.

XQ. 51. You think that was exaggerated?

A. Yes, sir.

XQ. 52. You understand thereby, don't you, that you are testifying that Dr. Crossley made an untruth-

ful statement in that regard; isn't that your understanding?

A. So it would imply.

XQ. 53. Well, you understood that to be the case?

A. Yes, sir.

XQ. 54. Now I want to know what you had to do with spending any of the money for this experimental work on cinchophen?

A. I had nothing to do with spending the money.

XQ. 55. And having had nothing to do with spending of the money, you are willing to testify here, and have testified, that Dr. Crossley lied when he said it was $60,000, is that right?

A. Well, I wouldn't say——

XQ. 56. Is that right? Answer it.

MR. ANDERSON: I think he was answering. I think he has got a right to explain it.

XQ. 57. Is that right? I want an answer to my question—"yes" or "no."

A. I cannot sit here, Mr. Kresel, and claim that Dr. Crossley lied. He may have been misinformed.

XQ. 58. What do you know about how much was spent, if you did not spend a dollar of it?

A I had access to the records. I was shown the records of the money—of the amount of money that the research work on cinchophen cost.

XQ. 59. Who showed them to you?

A. Dr. Fine.

XQ. 60. When?

A. In 1918.

XQ. 61. Were you still with the Calco then?

A. I was.

XQ. 62. What records did he show you?

A. He showed me all the cost sheets that came in from the Comptroller's Office.

XQ. 63. Did you examine them?

A. I did.

XQ. 64. Carefully?

A. Not very carefully.

XQ. 65. Did you make any memorandum of what they showed?

A. I did not.

XQ. 66. Do you know now what they showed?

A. No, I cannot remember.

XQ. 67. Not knowing what they showed, not remembering what they showed, you are still saying under your oath that Dr. Crossley's statement that it was $60,000 was not correct?

A. Yes, sir.

XQ. 68. You are employed by Herman Metz, aren't you?

A. I am.

XQ. 69. What work are you doing for Herman Metz?

A. I am doing research work on pharmaceuticals and bio-chemistry.

XQ. 70. And who told you to come here as a witness?

A. No one told me to come. Mr. Metz asked me if I would care to come.

XQ. 71. And I suppose you talked with Mr. Metz before you came here as to what you were going to testify about, did you not

A. Mr. Metz spoke to me about——

XQ. 72. Didn't you, yes or no?

A. I did.

XQ. 73. And you told Mr. Metz, did you, what you were going to testify?

A. No, I did not.

XQ. 74. Did he ask you what you were going to testify?

A. No.

XQ. 75. Who was at the head of the chemical work of the Calco Chemical Company in 1917?

A. You mean the Pharmaceutical Department or the whole Chemical Company?

XQ. 76. The whole Chemical Company.

A. In 1917, I believe Dr. Beardsley.

XQ. 77. And were you working under Dr. Beardsley?

A. I was not.

XQ. 78. Who was at the head of the work that you were prosecuting?

A. Dr. M. S. Fine.

XQ. 79. How many chemists were there working under Dr. M. S. Fine in 1917

A. At what period in 1917?

XQ. 80. In the fall of 1917.

A. Two were working under Dr. Fine.

XQ. 81. Were you one of the two?

A. I was.

XQ. 82. When Dr. Crossley came there, did he take Dr. Fine's place?

A. No, sir, he did not.

XQ. 83. What was his position there?

A. Whose?

XQ. 84. Dr. Crossley's.

A. He was made chief chemist, supposedly—there were usually half a dozen chief chemists—of the plant in general.

XQ. 85. And were you a chemist in the plant then?

A. In the Pharmaceutical Department.

XQ. 86. So during the remainder of your stay with the Calco Company Dr. Crossley was the chief chemist?

A. Yes.

XQ. 87. And you were one of the chemists in the Pharmaceutical Department?

A. That is correct.

XQ. 88. And your testimony is that you started experimenting with cinchophen in the fall of 1917?

A. That is correct.

XQ. 89. And you took this patent and you followed exactly the steps that are outlined there for the manufacture of cinchophen?

A. Correct.

XQ. 90. And having followed those steps exactly, you obtained cinchophen?

A. I did.

XQ. 91. The first time that you ever attempted it?

A. That is correct.

XQ. 92. And what yield did you get?

A. I don't recall the exact yield, but I believe about 60 per cent. of the theoretical.

XQ. 93. That is a pretty good yield, is it not?

A. No, not in chemistry in general. It is for this compound fairly good.

XQ. 94. That is what I mean; we are talking only about this compound. Do you remember when it was that you obtained this result from your first experiment?

A. Do you mean the exact date?

XQ. 95. I do.

A. I do not recall the exact date.

XQ. 96. And what month?

A. In August, 1917.

XQ. 97. Did you keep a record of your work?

A. I did.

XQ. 98. Where is it?

A. It is in the records and the property of the Calco Chemical Company.

XQ. 99. Made by you?

A. Made by me.

XQ. 100. Was that the only experiment you made on cinchophen?

A. No, sir.

XQ. 101. Did you continue to experiment?

A. Yes, sir.

XQ. 102. On cinchophen?

A. Yes, sir.

XQ. 103. How long did you continue?

A. About two to three weeks.

XQ. 104. And you were the only one that did the work?

A. At that period; yes, sir.

XQ. 105. You did it all yourself?

A. No, sir.

XQ. 106. Did you do any of it yourself?

A. Considerable.

XQ. 107. What part of the experiment did you do yourself?

A. Practically all of it—mixing the ingredients, carrying out the reaction, purifying the product.

XQ. 108. How many experiments did you make in those two or three weeks?

A. I should say at least fifty.

XQ. 109. And every experiment you made a record of?

A. Yes, sir.

XQ. 110. And those records are with the Calco Company?

A. They are.

XQ. 111. In what form were they?

A. In notebooks.

XQ. 112. Written in ink or pencil?

A. Both ink and pencil.

XQ. 113. And you made the records yourself?

A. I did.

XQ. 114. In your own handwriting?

A. In my own handwriting.

XQ. 115. Cinchophen is a drug that is widely used?

A. Some laborers—helpers.

XQ. 126. Under your instructions?

A. Under mine and Dr. Fine's instructions.

By THE COURT:

Q. 127. How long does it take you to make cinchophen?

A. The actual reaction will take about five to six hours.

Q. 128. I am going to ask you to make some for me. Are you equipped to do it?

A. Here?

Q. 129. Yes.

A. I doubt it, sir.

THE COURT: I will see that you get the equipment. We are up against a proposition here which I want some additional information upon.

MR. ANDERSON: Your Honor has now come to a question that I wished to raise and I was going to do it at a later stage. At the time of the discussion of the trade secrets a few days ago your Honor suggested, you will recall, that you would be very glad to permit the Government to actually produce with proper equipment in the courtroom, if that is practicable, or elsewhere, under proper regulations, any of the products called for by these patents. Some of which, like dyes, of course, would take weeks or months.

THE COURT: Yes, I understand that, but this only takes four or five hours.

MR. ANDERSON: I therefore determined this morning to ask permission of the Court to have the chemists, perhaps two chemists representing the Government and Dr. Freedman, if your Honor desires, on cinchophen, produce salvarsan and cinchophen chemically in a properly equipped laboratory such as may be designated, and make such tests as the conditions may seem to

warrant, on white rats or otherwise, both chemically and biologically, and that the Government be allowed to make several of these experiments with the formula—I do not know exactly how to express it, but your Honor understands—with leave to the defense to suggest others, the defense to be represented by chemists and counsel to witness the experiments and certify them to the Court, and with such other reasonable conditions imposed as may be deemed proper, all of which I can not recite for the moment because it requires a great deal of technical knowledge.

I am told that that will require a laboratory properly equipped and the use of ingredients which can be tested chemically, if desired by both sides. I therefore suggest and I feel that I can say the Government would be very glad to have these experiments carried on in the presence of the defendant's witnesses at the Hygienic Laboratory in Washington or at any other Laboratory properly equipped for this service.

MR. KRESEL: The defendant joins cheerfully in the suggestion now adopted by the Government in having these experiments performed. As to cinchophen, however, I understand there need be no delay since it is not going to take very long; and since Dr. Freedman is here, I should suggest that that be done immediately. As to the other experiments on salvarsan my understanding is that it will take days to do that. Dr. Christiansen said it would take him three days even if we started with the intermediate already made. I take it that we are not going to be held here now while that is being done. That may be done between now and the final argument. I am simply making that suggestion.

THE COURT: That may be begun; and then if

there is any disagreement among the chemists with respect to the certificate, I will accept the certificate if counsel can agree upon the facts; if not, some time prior to argument, we will hear the chemists.

MR. ANDERSON: I would like to have a chance, when we fix the details of this arrangement, to go more into detail to fully protect the experiments, so there can be no question on the subject.

MR. KRESEL: The Court will lay down instructions about that.

MR. ANDERSON: As to the cinchophen, this gentleman would have to have laboratory equipment and he would have to have ingredients which he knew to be the proper ingredients. I do not think he could stand up there in the courtroom and produce it at this time.

I understand Dr. Freedman is compelled to leave, unless the Court orders otherwise; and I therefore requested him to come over today and give this testimony. He is going to be married. That is something we would not like to interfere with. He asked if he could go away today. But he will make the experiment under such conditions as your Honor will deem reasonable. It will take only four or five hours.

THE COURT: Three hours, I thought you said.

THE WITNESS: Longer than that. It will take at least from five to six hours. There are two different condensations, which take from two to three hours.

THE COURT: I thought you told me it would take about three hours. My memory fails me. You can begin the experiment and complete it in five or six hours.

THE WITNESS: About six hours, yes.

MR. KRESEL: We will arrange to place at this

gentleman's disposal a laboratory and any of the ingredients that he requires. Dr. Bolton, is there a laboratory at the DuPont Company available?

DR. BOLTON: There is a laboratory on the outskirts of the town, at the Experimental Station.

THE COURT: Are you satisfied with that? If not, I will ask the defendant to produce here in this building, and use the corner room on this floor, such material and equipment as may be necessary.

MR. ANDERSON: I shall be very glad, sir. I do not know what equipment and material are necessary, but first I will go over with Dr. Freedman whether the laboratory is one that he can easily use. In the second place, nothing would give me greater pleasure than to have Dr. Bolton as one of the witnesses at the experiment.

THE COURT: I shall let the defendant make its own selection.

MR. ANDERSON: In suggesting that we want to go over the laboratory conditions, we want to know that they are conditions under which he could produce this stuff favorably. If not, we would not want to produce here.

THE COURT: Mr. Kresel, will you assign someone, designate now someone to arrange with Dr. Freedman with respect to a laboratory? Dr. Freedman must be free in his choice to perform the experiment at the DuPont Company's experimental station, if he so desires, or not.

MR. KRESEL: Very well.

THE COURT: And if the witness does decline, I will ask you to equip the corner room on this corridor with such material and equipment as may be necessary, if that can be done, and I think

it can be done most readily, and let the proceedings begin forthwith so that it may be done today.

MR. KRESEL: I want to make a suggestion, your Honor. If Dr. Freedman does not deem the experimental station of the DuPont Company as proper or available, I understand that at the Delaware State University they have a very fine laboratory; and perhaps Dr. Freedman would be willing to do the experimenting there. That is only a few minutes away.

MR. ANDERSON: That will be entirely agreeable to us. Whatever Dr. Freedman says will be satisfactory to the Government. The materials that he requires or the ingredients, I will leave entirely to him to select, of course.

THE COURT: Now then, if counsel are unable to agree as to the details, I will specify the details. I shall not make any further suggestions unless there is disagreement of counsel. That is all on both sides?

MR. ANDERSON: I would like to ask, while this witness is on the stand, that the accounts of the Calco Chemical Company, showing the amount of expenditures for experimental work, as to the matters testified by Dr. Crossley, be produced on Monday, if you can do that without a subpoena duces tecum.

THE COURT: What was the extent of Dr. Crossley's testimony with respect to that? Was it aggregate or in detail?

MR. KRESEL: In aggregate.

MR. ANDERSON: He stated on cinchophen and one other account and still one other, on three, aggregating a very large sum of money. I would like to have these accounts produced on Monday. Of course, I know counsel will do it if he can. If the Company will not respond to counsel's re-

quest, I make the suggestion at this time in order that I may ask the Court for a subpoena duces tecum for their production on Monday.

MR. MAHAFFY: I am informed that the State Board Laboratory has been recently removed to the City Building, to be equipped here. I am informed that the State Board of Health Laboratory has been recently fitted up there.

THE COURT: Make your own arrangements. If you can agree, I am satisfied. If not, I will specify the details. Will you include in your request, also, Col. Anderson, the note books of Dr. Freedman?

MR. ANDERSON: I shall be very glad to have the note books produced. If they are among the records of the Calco Chemical Company, they may be produced.

I understand that the defendant will have a chemist present and the Government will have another chemist present and that counsel on either side may attend as well.

THE COURT: Yes.

XQ. 130. Dr. Freedman, my understanding was that you could do this work in six hours.

A. Yes, sir, according to the patent.

XQ. 131. You say now that you need some ingredients that you have got to make?

A. The patent says pyroracemic acid.

XQ. 132. Well, you did not include that in your estimate?

A. I did not.

XQ. 133. How long will it take you to make that?

A. I can not definitely state, but it may take a a day before I get enough for it. It is a process that requires a dry distillation at a high heat, and I need a certain kind of a retort for it, which may or may not be available, I don't know.

XQ. 134. Then I understand that you say now that it will take you a day to do this experiment?

A. At least a day.

By Mr. Anderson:

RDQ. 135. Making the intermediate?

A. Making the intermediate, if I have luck.

By Mr. Kresel:

XQ. 136. If you have luck?

A. Yes, sir.

The Court: Let the process begin as soon as possible.

Mr. Kresel: Of course, it is understood, your Honor, that no one is to assist this gentleman or give him any instructions, either Dr. Gibbs or anybody else.

Mr. Anderson: Of course, that goes without saying.

The Court: Necessarily; and it necessarily follows that such instructions would not be of any service anyhow, because the process of the patent is to be followed strictly.

Mr. Anderson: Dr. Gibbs, you will understand, of course, that the patent is to be followed.

The Court: No, Dr. Gibbs has nothing to do with it, except as an observer.

Mr. Anderson: As an observer. What I meant was that your Honor's suggestion was to be followed.

The Court: And the experiment is solely that of Dr. Freedman, without any suggestion from Dr. Gibbs, either positively or negatively.

Mr. Anderson: Quite true, sir.

The Court: All observers may take notes of each step, and those notes will be available in Court, if necessary, and may be used as a

basis for refreshing their recollection in the event of examination.

MR. ANDERSON: And I understand, your Honor, that the chemist making the experiment may have every opportunity to be sure of the quality of his ingredients before he starts.

THE COURT: Absolutely.

MR. ANDERSON: And satisfy himself that he has the proper quality of ingredients to carry out the experiment, no matter how much time it takes.

THE COURT: Correct. And I reserve the right at the conclusion of the testimony to call on my own initiative any and all persons present at the time the experiment is made, if I conclude to do so.

MR. ANDERSON: Yes, sir. You understand that, Dr. Freedman?

THE WITNESS: Yes, sir.

THE COURT: Mr. Kresel, have you made your selection of an observer?

MR. KRESEL: Yes, your Honor, I have sent for Dr. Crossley. It will be some time before he can get here; but in the meantime I have designated Dr. Joyce to follow the experiment.

MR. ANDERSON: Who is Dr. Joyce?

MR. KRESEL: Dr. Joyce is a chemist of the Chemical Foundation.

THE WITNESS: May I ask Mr. Kresel a question?

MR. KRESEL: Certainly.

THE WITNESS: If you have sent for Dr. Crossley, he could easily bring some of that pyroracemic acid with him, because they make it there; then the operation can start as soon as I get the ingredients.

MR. KRESEL: All right; I am going to try to get word to him to that effect.

MR. KRESEL: If your Honor please, I would rather not. I prefer this gentleman make his pyroracemic acid.

(Colloquy between Court and counsel off record.)

RE-DIRECT EXAMINATION.

By MR. ANDERSON:

RDQ. 137. Dr. Freedman, you have just stated to me that you would have to get a certain acid or make it yourself in your laboratory, and that you did not believe that you had the instruments here. You asked if I could arrange with the Court to have you come back here at the end of next week, cut your honeymoon short and make the experiment next week in the presence of anybody you saw fit.

A. Yes, sir.

MR. ANDERSON: I wanted to put the witness on the stand to state that.

RDQ. 138. Will you make the statement to the Court that you made to me just now, for the information of the Court?

A. Your Honor, I would be willing to come back here shortly after my wedding.

By THE COURT:

Q. 139. When is your wedding?

A. Tuesday night.

Q. 140. Would it interfere with your plans to take the six hours necessary today, or continue during the night?

A. Well, you see, your Honor, in order to make cinchophen I must have pyroracemic acid, and in order to make that in a pure state I must have a high pressure vacuum pump, otherwise the matter decomposes.

THE COURT: Well, could those things be furnished?

DR. BOLTON: I am not quite familiar with those facilities at the Station. We may have it, and it seems to me we should have apparatus of that kind.

THE WITNESS: I would not be confident of the stuff unless I made it in my own laboratory, and I can easily do that within a day.

RDQ. 141. You mean the starting ingredient?

A. The starting ingredients, yes, sir. I can buy two of them. Benzol and anilin I can purchase on the market pure, but the other one I believe I will have to make.

THE COURT: But you start with something.

RDQ. 142. What does the patent start with?

MR. KRESEL: If your Honor please, this man said that he made the ingredient that went in——

THE WITNESS: Yes, I did.

MR. KRESEL: What?

THE WITNESS: Pyroracemic acid.

MR. KRESEL: I want him to have this thing made from the very beginning, just as he said he did in the Fall of 1917.

MR. ANDERSON: If your Honor will permit me, as I understand the witness's position, it is this: He made it and he can make the necessary ingredient in his laboratory now. The obligation here is to start with the starting point of the patent, having the ingredients called for by the patent, and follow through the patent and make this stuff. Dr. Freedman tells me that the original ingredients are of the greatest importance in starting this, as well as the proper appliances; that it will take him time to make the original ingredients or to get them where he knows they are absolutely pure, otherwise he

would be risking his whole reputation and everything else on this experiment. Of course, he must not do that: he must get these ingredients pure or make them himself, but his obligation here is to start at the starting point of the patent.

THE COURT: He is in a position now where he has no alternative.

MR. ANDERSON: That is right, and he recognizes that, and he wants to be sure that every step is right, that is all. I think he is entitled to every chance to do that. But he is perfectly willing to make this experiment. He is naturally risking his reputation, his good name and his word on this situation, and he naturally wants to be very careful of his ingredients, and I would too.

THE COURT: I am not complaining of that, but my first thought was it took three hours; then I thought it took six hours, and then I thought it took a day.

THE WITNESS: If your Honor please, it would take six hours if I had all the ingredients present.

RE-CROSS-EXAMINATION.

By MR. KRESEL:

RXQ. 142-a. May I ask, Dr. Freedman, what is the first ingredient that is spoken of in the patent (handing patent to the witness)? Just read it.

A. Yes, sir. Just a minute. Anilin.

RXQ. 143. You do not have to make anilin?

A. I don't.

RXQ. 144. You did not make it in 1917?

A. No, sir.

RXQ. 145. That you have got available?

A. Yes, sir.

RXQ. 146. That is the first thing you start with, is it?

A. Yes, sir.

RXQ. 147. You are sure about that?

A. Positive.

RXQ. 148. That is the first thing that is mentioned in that patent?

A. That is right.

RXQ. 149. What is the next thing that you take?

A. Benzaldehyde.

RXQ. 150. Did you make that in 1917?

A. No, sir.

RXQ. 151. That is readily available?

A. Yes, sir.

RXQ. 152. And you can satisfy yourself before you start as to whether that is pure?

A. I can; yes, sir.

RXQ. 153. So there is no difficulty there?

A. No, sir.

RXQ. 154. What is the next ingredient?

A. Pyroracemic acid, otherwise known as peruvic acid.

RXQ. 155. Peruvic acid you made in 1917?

A. Yes, sir.

RXQ. 156. It was not available in the market?

A. It was not.

RXQ. 157. And what ingredients do you need to make peruvic acid?

A. I need sodium bitartrate, tartaric acid.

RXQ. 158. That is easily available?

A. Yes, sir.

RXQ. 159. What is the next?

A. Sodium bisulphate.

RXQ. 160. You can get that easily?

A. I think so.

RXQ. 161. And you can satisfy yourself as to the purity of those?

A. I think so, yes.

RXQ. 162. How long will it take you to get those, to make peruvic acid sufficient for your experiment?

A. If I have the proper equipment?

RXQ. 163. Yes.

A. One day.

RXQ. 164. A whole day to make the acid?

A. Yes, sir, because I must purify the acid.

RXQ. 165. What equipment do you need for the purpose?

A. I need an iron retort of about a capacity, maybe, of half a gallon; I need a large burner, gas burner; I need a condenser, and I need a glass receiver.

RXQ. 166. Is that all?

A. That is all for the beginning of this——

RXQ. 167. For the peruvic acid, I mean?

A. Yes. Now, I must purify this acid before I can use it. I need some round bottom flasks made out of glass.

RXQ. 168. Those are available, of course?

A. Yes. And I need a high vacuum pump to give me at least 10 millimeters vacuum, and very few places have a pump like that.

RXQ. 169. Well, I think we can furnish it to you.

A. All right, very good.

RXQ. 170. Then having made your peruvic acid, will it take you six hours more after that to complete your experiment and obtain what you say is cinchophen?

A. Approximately six hours; yes, sir.

RXQ. 171. So we can count on your spending a day and six hours in making that experiment?

A. Yes, sir.

RXQ. 172. Is that as long as it took you in making your experiment at the Calco Laboratory,

which resulted in your producing 60 per cent cinchophen?

A. Approximately that time. In making crude cinchophen, if you please.

RXQ. 173. Crude cinchophen?

A. Yes, sir.

RXQ. 174. You did not tell us anything on your direct about crude cinchophen.

A. We were talking, if you please, Mr. Kresel, about the patent.

RXQ. 175. Were you not asked by Col. Anderson whether you had produced cinchophen?

A. Accordingly—as given in the patent.

RXQ. 176. Just answer my question. Weren't you?

A. Yes.

RXQ. 177. Did you not understand that he was asking you whether you produced crude cinchophen; was that your understanding?

A. Cinchophen as given in the patent.

RXQ. 178. Was that your understanding?

A. Yes, sir.

RXQ. 179. So what you meant to say was that you produced crude cinchophen in the Calco Laboratory by working a day and six hours?

A. Yes, sir.

RXQ. 180. And that you produced it the first time you tried?

A. Yes, sir.

RXQ. 181. And that it was a sixty per cent. yield?

A. Approximately that. I do not remember the exact figures.

RXQ. 182. Well, you told us sixty per cent. on your direct. Do you want to correct that?

MR. ANDERSON: He did not say exactly.

A. I said approximately sixty per cent.

RXQ. 183. What distinction do you draw between cinchophen and crude cinchophen?

A. Crude cinchophen is the substance obtained directly from the reaction; cinchophen as put on the market is a substance by which the crude cinchophen is purified by crystallization from various solvents.

RXQ. 184. Did you purify it?

A. Yes, sir.

RXQ. 185. You finally produced the pure cinchophen?

A. That is correct.

RXQ. 186. Will it take you any more time than the day and six hours to produce the purified cinchophen?

A. It may take me a little time to purify it.

RXQ. 187. How long will it take you to purify it?

A. Oh, approximately—I cannot say definitely. Maybe three, maybe four hours.

RXQ. 188. So now we have it a day and ten hours that it will take you to make this experiment?

A. That is correct.

RXQ. 189. And you would prefer to do it in your own laboratory?

A. I would, to make my pyroracemic acid in my own laboratory.

RXQ. 190. I see. Well, if the ingredients are obtainable to you in any laboratory, and the equipment that you have described, you have no objection to doing the work there?

A. Absolutely none.

MR. KRESEL: All right, we will try to accomodate you.

THE COURT: Any questions, Col. Anderson?

MR. ANDERSON: None whatever. The only question in my mind was whether we are going to carry on these other experiments and the Court would——

THE COURT: I will not bring Dr. Freedman back here at the end of the week. I do not think that would be right. So let the process begin, Mr. Kresel to arrange to get the equipment, and they can use any laboratory that counsel agree on; if you do not agree we will let you and the Government——

MR. KRESEL: You will designate one.

THE COURT: We will equip one here in the building.

MR. ANDERSON: (Addressing witness): You understand, Doctor, that in the making of this experiment you are entitled to take all the time necessary to either make sure or to satisfy yourself of the purity of all ingredients that you use, to the end that your experiment may express your chemical knowledge.

THE WITNESS: I do.

MR. ANDERSON: And you are also entitled to have the instruments and appliances which are adequately suited to the performance of your experiment.

THE COURT: Now then, if the appliances furnished are not what you want, do not begin your experiment, but come back here and let me know wherein the appliances furnished are inadequate or not what you want, because I am not going to permit you to say should you fail—and I am not anticipating a failure—should you fail you will not be excused on the ground of inadequate equipment. So be satisfied with your equipment when you begin.

THE WITNESS: All right.

THE COURT: Let the experiment begin as soon as possible.

MR. ANDERSON: Who is going to represent the defendant, of the chemists?

MR. KRESEL: Dr. Bolton, for the present. But as soon as Dr. Crossley comes, I want Dr. Crossley to join Dr. Bolton.

MR. ANDERSON: In that event, I shall want others too.

MR. KRESEL: I had no objection to the Government having as many as we have.

MR. ANDERSON: Is there going to be a representative of the Court or Marshal in charge of the performance?

THE COURT: I had hoped that that would not be necessary.

MR. ANDERSON: It looks like it is going to last two days and I want every safeguard thrown around it. In other words, the material should never be left at any time except in the presence of someone, I think, designated by the court. I think the material should be guarded night and day.

THE COURT: Too great safeguards can not be thrown around the experiment.

MR. ANDERSON: I agree with your Honor.

THE COURT: As I understand, Dr. Bolton and Dr. Crossley are the two chemists representing the defendant.

MR. KRESEL: Yes, your Honor.

THE COURT: I will designate not only the Marshal, but I will ask him to submit to me the names of deputies.

MR. ANDERSON: I would ask leave to put someone there with Dr. Gibbs so that Dr. Gibbs can be relieved. A man can not sit up two days. We want one man present at all times.

THE COURT: Does it take constant attention?

MR. ANDERSON: I do not know, sir. I do not

know a thing about it. But at all times there should be one.

THE COURT: I thought you were going to have two on either side. You have your witness—he is your witness—and one additional chemist. Then you would have two chemists on the other side. Your witness is one chemist and any other chemist you want to put with him is another. Against those two, it seems to me the defendant is entitled to two.

MR. ANDERSON: But it is the witness's work that is being observed. Suppose a controversy arose as to what he did, something of that kind, then the defendant has two witnesses.

THE COURT: But he is on the same basis as any witness that you send along with him. I think he is one of your men. I should take his testimony and take the testimony of the others. I do not think that you are entitled to an additional representative.

THE COURT: I will designate not only the difference arose as to what was the exact step taken, and the two witnesses for the defense testified against the one witness for the Government. The evidence of the witness who was doing the experiment, if there was such a controversy, would be under great handicap.

THE COURT: No; I would take his evidence just as quickly as I would that of the other representatives, as far as I am concerned. I will consider asking persons not interested to join in the observation. I do not think of a person at the moment, but I will think of it, and you may proceed with your next witness, and do not let the experiment begin until your representatives are present. You may collect your materials; but let

there be two chemists on each side present when the experiment begins.

MR. KRESEL: Colonel, Dr. Christiansen has asked me whether he may go for the day. As far as I am concerned, if we are going on on Monday, as I assume we are, he may go for the day, but the understanding is that he will be back Monday morning.

(Discussion off record.)

MR. ANDERSON: I suggest, Dr. Christiansen, that you wait until the end of the morning session.

THE COURT: Dr. Christiansen, is the Harvard Medical School under the direction of the University?

DR. CHRISTIANSEN: It is; it is a part of the University.

WILLIAM O. EMERY.

WILLIAM O. EMERY, called as a witness on behalf of the plaintiff, in rebuttal, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. ANDERSON:

Q. 1. Please state your name and where you live.

A. William O. Emery, Washington, D. C.

Q. 2. What is your profession?

A. Chemist, organic.

Q. 3. Dr. Emery, please state where you were educated; the degrees, if any, you hold; and briefly, your experience as an organic chemist.

A. Graduate Worcester Polytechnic Institute, B. S.; Ph. D. University of Erlangen in 1888; student, research chemist, instructor, in Docent, University of Bonn, 1886 to 1893.

Q. 4. Where is the University of Bonn?

A. Germany.

Q. 5. Go ahead.

A. Then, research laboratory in Chicago, 1893 to 1895. From 1895 to 1901, Professor of Chemistry, Wabash College, Indiana. From 1901 to 1907 research chemist here and abroad. From 1907 to the present time in the Bureau of Chemistry, fifteen years Chief of Synthetic Products Laboratory, Division of Drugs, Bureau of Chemistry.

Q. 6. Dr. Emery, have you ever tried to make salvarsan or arsphenamine?

A. I have.

Q. 7. In what year?

A. Toward the end of 1916 and the beginning of 1917, about.

Q. 8. I hand you Defendant's Exhibit No. 156, Patent No. 986,148, March 7, 1911, to Paul Ehrlich and Alfred Bertheim. Will you please examine that patent and state if you did your work in the making of salvarsan or arsphenamine in connection with that patent?

Mr. Anderson: And then I am going to ask him what he did.

A. Substantially according to this patent, but most strictly according to the——

Mr. Kresel: No, no.

Q. 9. Just say "yes" if you can.

A. Yes.

Q. 10. Now I will ask you to take the patent, if you wish, and state what you did in making this product as if you were telling me or the Court exactly the steps by which you did it, and how it was to be done.

A. The time is rather remote, of course, during which the experiments were performed; but in general, I can say that the well-dried sodium salt of the hydroxy

acid named in the patent was introduced into concentrated sulphuric acid in the proportions named——

Mr. Kresel: Named where, please?

A. (continued) In the patent; and the temperature maintained was not allowed to rise above zero.

After the incorporation of this hydroxy acid in the sulphuric acid, a nitrating mixture consisting of equal parts of nitric acid of definite strength and concentrated sulphuric acid was slowly added, and during both these treatments the mixture constantly agitated —stirred, the temperature being always kept at or below zero, the reaction flask being surrounded by ice and salt.

After a time, the temperature was permitted to rise about ten degrees—perhaps one or two degrees below—but not higher than ten degrees, and in the first batch, after three or four hours, this product was poured into water. The second batch, as I recall, the mixture was allowed to stand over night in a refrigerator.

At the time the reaction was believed to be complete, a light yellow crystalline product separated out and that was filtered off by suction, washed, and then recrystallized from hot water, whereby the color seemed to become a little brighter. The nitro product so obtained was then dissolved in the required amount of the patent.

Q. 11. You are entitled to look at the patent to refresh your memory.

A. I do not think I want to. I have that pretty clearly in mind. It is only necessary to form a sodium salt of this nitro compound and one never uses it more than the caustic required. That was so dissolved and poured, with stirring, into an aqueous mixture of hydrosulphite and magnesium chlorid in the proportions named.

Mr. Kresel: Named in the patent, I assume?

A. (continuing) In the patent, as near as I could follow. And the mixture maintained at about a temperature of 50. Gradually a powdery light yellow product separated and when the separation appeared to have ceased, the separated product was filtered off by suction and washed, dried, and then converted into the dihydrochlorid by treatment with methyl alcohol containing hydrochloric acid and this liquid poured into ether. The precipitate of hydrochlorid was then filtered out by suction, very carefully dried and subjected to tests, chemically.

Q. 12. What did you find you had produced?

A. I had produced salvarsan, arsphenamine. In the first case, I could not be proud of the product because I thought it was not yellow enough. In the second case it appeared to have the proper color and both samples seemed to correspond to the chemical tests laid down and according to which we were operating at the time.

Q. 13. Where did you make these tests?

A. In the Bureau of Chemistry, Washington.

MR. KRESEL: You mean these experiments?

MR. ANDERSON: These experiments.

Q. 14. In the Bureau of Chemistry at Washington?

A. Yes.

THE COURT: (Addressing Deputy Marshal Ball):

Marshal, some cinchophen is to be made by Dr. Freedman who was on the stand this morning. That experiment is to be made at a laboratory selected by Dr. Freedman, either the duPont Company experimental laboratory or the one in the City Building, or one set up in the corner room of this corridor. There is to be present the experimenter, Dr. Freedman; and Dr. Gibbs is to be your representative, Colonel Anderson?

MR. ANDERSON: Yes, sir. He is the only man I have available today.

THE COURT: There will be another chemist present on behalf of the Government. Dr Bolton who testified yesterday or a few days ago will be one of the representatives for the defendant. Dr. Crossley will be the other representative of the defendant.

MR. KRESEL: Until Dr. Crossley arrives, I have asked Dr. Joyce to be present.

THE COURT: Have you obtained Dr. Crossley?

MR. KRESEL: He will be here after four.

THE COURT: Is there any objection to the substitution?

MR. ANDERSON: I would rather we would not. I think if we are going to start this thing, we ought to start it with the men who are going to stay through.

THE COURT: Very well. Let the experiment start with the arrival of Dr. Crossley and then hurry it as much as you can, because I prefer to have the same witnesses throughout; because otherwise there might be a question as to the value. The representatives of the press have, by consent of counsel, been authorized to be present; and a lawyer from each side is authorized to be present.

I want you to take personal charge of the laboratory in which this is made and see that at no time is there any person in that laboratory save when there are both chemists of each side present; and if counsel agree, that there shall also be legal representatives from each side. We will restrict your duties to seeing that no person is in the laboratory except you or your deputy unless all of the four chemists are there. You need not be concerned about the lawyers. You will need a deputy, and before you appoint him, I will ask

you to do the unusual thing of submitting his name to me for approval. This is to apparently begin at four o'clock this afternoon and you will be put in touch with these people by Colonel Anderson or Mr. Kresel. But I am looking to you to know whether that experiment is carried out wholly beyond all suspicion as far as the people in the room are concerned. It is a continuous process because, even though they are not experimenting all the time, you will have to have a man there. Have you anybody in mind at the moment?

MARSHAL BALL: No, your Honor. I will take it up with you at recess.

THE COURT: Very well.

By MR. ANDERSON:

Q. 15. Can you state about the time that you made each of the experiments mentioned?

A. I think the first one was carried out toward the end of December, 1916 and the second one toward the end of January or the beginning of February, 1917. That is to the best of my memory.

Q. 16. As I understand, you did not test this product on animals?

A. Not at all.

Q. 17. Did you test it chemically?

A. Yes, sir.

Q. 18. Did it give a satisfactory chemical test?

A. Both were entirely satisfactory as far as the chemical tests went. The color of the first product in the aqueus solution was too dark, was slightly darker, somewhat darker than should be in first-class preparations.

Q. 19. How about the second, sir?

A. That was perfectly all right.

Q. 20. Did you carry your experiments any further than you have indicated?

A. Not at all. On account of information I had received, they were discountinued.

MR. KRESEL: I ask that the latter part, from "not at all" on, be stricken out.

THE COURT: Motion granted.

MR. ANDERSON: No objection, sir.

Q. 21. Dr. Emery, as a chemist with the experience which you have indicated, where a formula in a patent or otherwise is given you for the production of a highly dangerous drug, either for internal administration or injection into the veins, would you or would you not assume as an element indicated to one skilled in the art that the ingredients used should be pure or purified at proper stages in the process?

A. Undoubtedly.

Q. 22. Would or would it not be necessary, in your opinion, to state to one skilled in the art that such purity in ingredients or purification at proper stages was an essential in the production of drugs for that purpose and of that character?

MR. KRESEL: I object to that on the ground that that is not a subject of expert testimony.

THE COURT: I think that objection is well taken. I will hear you though, Colonel Anderson.

MR. ANDERSON: I think, sir, that the practice, the recognized principles of chemistry as applied to the manufacture of things of that kind, is one of the things as to which experts can testify.

THE COURT: We get back do we not, to the fundamental difficulty of who is skilled in the art, which is a question for legal determination.

I will take his answer and grant an exception to the defendant.

THE WITNESS: May I have that question repeated, please?

(Q. 22 repeated as recorded above.)

CROSS-EXAMINATION.

By MR. KRESEL:

XQ. 23. Dr. Emery, the Government maintains various chemical laboratories, does it not?

A. Yes, sir.

XQ. 24. For instance, there is this laboratory with which you are connected. What do you call it, a pharmaceutical laboratory?

A. No. Up to within recent times, it was the Division of Drugs.

XQ. 25. Division of Drugs of what department?

A. Bureau of Chemistry, Department of Agriculture.

XQ. 26. In other words, there is a Bureau of Chemistry in the Department of Agriculture and that Bureau of Chemistry has several divisions?

A. Yes, sir.

XQ. 27. And one of these divisions is the Division of Drugs?

A. Yes, sir.

XQ. 28. And that is the one with which you are connected?

A. Yes, sir.

XQ. 29. And I take it that in the Bureau of Chemistry of the Department of Agriculture, there are quite a number of chemists employed?

A. Yes, sir.

XQ. 30. About how many?

A. In Washington and outside?

XQ. 31. Yes.

A. I could not say. I could only make a rough guess.

XQ. 32. Approximately.

A. During the war, I suppose, or about the war period, we had from 150 to 200; a very rough guess.

XQ. 33. Counsel did not ask you and I do not understand that you have said so, but I want to ask you

whether the result that you obtained, as you have described it, was obtained by you by simply following the steps set forth in that patent?

A. Absolutely.

XQ. 34. You did not add any step; you did not omit any step; is that correct?

A. Not to my knowledge.

XQ. 35. And you obtained a yellow powder?

A. Yes, sir.

XQ. 36. You did not test it on animals or human beings?

A. Not at all.

MR. KRESEL: That is all.

RE-CROSS-EXAMINATION.

By MR. ANDERSON:

RDQ. 37. I think I asked the question before: You did test it chemically in your laboratory?

A. Undoubtedly.

MR. ANDERSON: I thought I asked that question, but I wanted to be sure.

RE-CROSS EXAMINATION.

By MR. KRESEL:

RXQ. 38. Dr. Emery, I intended to ask you whether you knew in late 1916 and early in 1917 that there was a great scarcity of salvarsan in this country.

A. Undoubtedly.

RXQ. 39. The tests that you made were what you chemists call qualitative tests or quantitative tests?

A. Both.

By THE COURT:

Q. 39-a. There is one question I want to ask. If the patent in specifying the steps to be taken to make one of the intermediates should not produce a pure intermediate and the patent said nothing about taking

additional steps to bring about such purity, would you consider it a necessarily implied provision in the patent that such additional steps should be taken?

A. Always. May I explain? No matter under what label an organic chemical comes to me, I always test its purity, even the so-called Kjeldahl class, either by redistilling or recrystallization; at any rate verifying the constants that the particular substance should have.

By The Court:

Q. 40. This patent specifies, for instance, the first intermediate?

A. Hydroxyarsinic acid.

RXQ. 41. Does it produce a pure intermediate when you follow the steps of the patent, or do you have to take steps in addition to that?

A. It might; but I always prefer to——

RXQ. 42. No, not your preference; but following the process of the patent, does it or does it not produce a pure intermediate?

A. I could not say that without knowing the quality of the starting drug.

By Mr. Kresel:

RXQ. 43. Doctor Emery, will you describe exactly what quantitative test you made?

A. Why, I used both the Lehmann and the Ewens tests for the determination of arsenic.

Now, the Lehmann test is considerably shorter, and for that reason preferable. In the Lehmann test the procedure consists essentially of destroying the arsenical by treating with permanganate of potash in presence of sulphuric acid, then destroying any excess of permanganate of potash by the addition of hydrogen peroxide, getting rid of the excess of hydrogen peroxide by the addition of oxalic acid; then adding potassium iodide to the re-action mixture, whereby iodine is set free by the arsinic acid formed in this decomposition,

and then after a certain period of standing, titration of the liberated iodine with standard hypo solution—sodium thiosulphate of the photographer.

(No RXQ. 44.)

RXQ. 45. Had you finished?

A. That covers the Lehmann method. Now, the Ewens method is essentially a Kjeldahl method——

RXQ. 46. Without your going into a description of the method, this test was made for the purpose of determining what?

A. The percentage of arsenic, total arsenic in the compound.

RXQ. 47. Only arsenic?

A. Arsenic, yes, sir.

RXQ. 48. Not nitrogen?

A. Not at all.

RXQ. 49. What was the amount of total arsenic that you found to exist in this yellow powder as a result of your first experiment?

A. Slightly under 31 per cent., and practically the same percentage of arsenic in the second; apparently a little difference in arsenic content in both samples.

MR. MAHAFFY: Will your Honor pardon me just a moment. There is some dispute about the test, and I want to explain it to counsel, so that they may bring it to the attention of the Court.

THE COURT: Yes.

(Mr. Mahaffy confers with Mr. Kresel.)

MR. KRESEL: The first question, I understand, that has come up, is this: Dr. Freedman insists that he will get his own peruvic acid wherever he pleases. Our understanding is that he is to make the acid as he says he made it in 1917.

MR. ANDERSON: Not unless the patent calls for it, sir.

THE COURT: What does the patent call for?

MR. ANDERSON: If the patent calls for the making of the acid, then he must make the acid; but if the patent merely calls for the use of the acid, then he does not have to make it.

MR. KRESEL: Here is what the patent says: "According to Dobner & Gieseke"—then he gives a reference to some volume—"2-phenylquinolin-4-carboxylic acid can be obtained by dissolving equal molecules of pyroracemic acid and benzaldehyde and gradually adding to the solution——"

THE COURT: Is that the process there is a dispute about?

MR. ANDERSON: The pyroracemic acid is the thing that they want to make.

THE COURT: And the patent specifies the manner of its making?

MR. ANDERSON: No, sir, it only specifies its use.

THE COURT: I thought Mr. Kresel was reading from it.

MR. KRESEL: Let me read it again.

MR. ANDERSON: I will leave that to Dr. Alleman. Does it specify the making of pyroracemic acid or does it specify its use?

DR. ALLEMAN: I would not care to answer that, Colonel, because I have not read the patent.

MR. KRESEL: "According to Dobner & Gieseke, 2-phenylquinolin-4-carboxylic acid can be obtained——"

THE COURT: Is that the acid which is in question?

MR. KRESEL: I do not know.

MR. ANDERSON: No, sir.

MR. KRESEL: "By dissolving equal molecules of pyroracemic acid and benzaldehyde and gradually adding to the solution——"

THE COURT: Pyroracemic acid is the acid in question?

MR. ANDERSON: That is the acid that is spoken of here that he says is essential. The putting of those two together produces that result.

THE COURT: Pyroracemic acid is the acid that——

MR. KRESEL: That he said was not obtainable here at the time, and that he made it.

MR. ANDERSON: That is true; but he made it because it was not obtainable at the time. But there is nothing in this patent that requires a man to make that acid. The patent calls for the use of that.

MR. KRESEL: We are testing the credibility of this witness.

MR. ANDERSON: Not at all. We are testing his ability to make this stuff under this patent.

THE COURT: He may use his pyroracemic acid; but your chemist may subject that pyroracemic acid used by him to all the tests which are necessary for you to determine its quality, and sufficient of that is to be supplied by him to you to enable your chemist to determine the quality of that acid.

MR. KRESEL: That is all, Doctor.

By MR. ANDERSON:

RXQ. 50. The methods of test, the chemical test that you spoke of, Dr. Lehmann's and some other tests are well known in the art, are they not, the standard tests to chemists?

A. Yes, sir, they are well-known; they are in fact laid down in a bulletin issued by The Public Health Service.

By MR. KRESEL:

RXQ. 51. Doctor, how did you know that you had arsphenamine?

A. I suppose skill in the art.

RXQ. 52. What?

A. I suppose skill in the art, familarity with those substances.

RXQ. 53. Had you ever before made it?

A. No, sir.

RXQ. 54. You did not test it on any animals or human beings?

A. Yes, sir.

RXQ. 55. You had a yellow powder?

A. Yes, sir.

RXQ. 56. Do you know any other in your capacity as a chemist for so many years; have you ever seen any other yellow powder?

A. Lots of them.

MR. ANDERSON: Stand aside, Doctor.

(Witness excused.)

MR. ANDERSON: Dr. Gibbs, will you take the stand.

MR. KRESEL: Your Honor, I am sorry to keep interrupting this way, but Dr. Bolton informs me that Dr. Freedman wants to send to New York for this acid.

THE COURT: Is that the acid that he said it would take a specified time to make?

MR. KRESEL: Yes, a day to make.

MR. ANDERSON: A day.

THE COURT: Allowing them a day and ten hours or nine hours, whatever it was, for completing the process?

MR. KRESEL: Yes, sir.

THE COURT: Is that the acid he said he made in 1917, which was not then available?

MR. KRESEL: Yes, sir.

THE COURT: He can use in his experiment such acid as he wants, but I will ask him if he can carry on both processes apparently, to make pyror-

acemic acid. He need not delay his first experiment by making pyroracemic acid, but I shall ask him to make pyroracemic acid as well and report to the Court.

MR. ANDERSON: And I would respectfully ask, if your Honor please, that if he wants to send for the acid made, that I will be very glad to have anyone go with him to get his acid, and to see that he brings the stuff, or any other precaution; but if he wants to send for an acid that will take him twelve hours to make, and which is a difficult chemical process outside of the patent, and he has got the acid that he knows he can use, then I will ask that he be allowed to send for it.

THE COURT: Why, I say that he may use it, but we have two things. We have in his testimony the statement that he produced under this patent. That is important. We have also in his testimony what is not less important, that he produced in 1917 under this patent—1916 or 1917, which was it?

MR. ANDERSON: Nineteen hundred and seventeen, but not under this patent, sir.

THE COURT: No, not that he produced pyroracemic acid under this patent, but that he produced pyroracemic acid in 1917 and used the product of his own manufacture in carrying out the processes of the patent.

MR. ANDERSON: Very true, sir.

THE COURT: So there is a dual thing involved, that is the production under this patent and also the production in 1917, of this acid. So he may send for his pyroracemic acid, but I am going to ask him to make some pyroracemic acid at the same time.

MR. ANDERSON: I would reserve the objection, though I do not wish to argue it at this

time—because I have no doubt he would be very glad to make the pyroracemic acid—that the effort to make the complicated intermediate requires an entire day and I would respectfully argue that that would not in any way affect the statement that he had made it, would not affect the statement that he had made cinchophen under this patent.

THE COURT: I think not, but you see we may get a product varying from here to here, in quality and in quantity, and so on.

MR. KRESEL: One of my points is, your Honor, that this man said in 1917 he made cinchophen using the peruvic acid that he made.

THE COURT: Of his own manufacture?

MR. KRESEL: Of his own manufacture. That is one of the things that I would like to have him show us. I understand his Honor to rule that he may use any acid that he already has.

THE COURT: Yes.

MR. KRESEL: And carry through an experiment with that.

MR. ANDERSON: Or any acid he can buy.

THE COURT: Or any acid that he wants——

MR. ANDERSON: To select.

THE COURT (continuing): To select. But before he left the stand he indicated clearly he wanted the time necessary to make the pyroracemic acid so as to be sure it was pure. I am going to let him use either that or——

MR. ANDERSON: I will ask that he comply with the patent, with your Honor's permission, by using any acid or ingredient he may select. Then if your Honor desires him, after making it according to the patent, to make the ingredient not called for by the patent, that is another question.

THE COURT: I will get him to do both before

reporting, and he may get his pyroracemic acid any place he desires, supplying the chemists of the defendant with such amount as will enable them to determine its quality.

MR. ANDERSON: All right, sir.

HARRY D. GIBBS.

HARRY D. GIBBS, a witness called on behalf of the plaintiff in rebuttal, being duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. ANDERSON:

Q. 1. Please state your name and place of residence.

A. Harry D. Gibbs, Washington, D. C.

Q. 2. What is your profession?

A. Chemist.

Q. 3. Where are you now employed and what is your position?

A. My title is Senior Chemist in the Hygienic Laboratory of the Public Health Service.

Q. 4. The Public Health Service of the United States?

A. Of the United States, Treasury Department.

Q. 5. Dr. Gibbs, will you please state your education and experience as a chemist, briefly—just summarizing it?

A. I studied, after primary education, at the Rose Polytechnic Institute, Cornell University, University of California, Stanford University; received the degrees of Bachelor of Science at Cornell University and Doctor of Philosophy at Stanford University.

Q. 6. Now state your experience generally, if you please.

A. My experience, briefly stated, omitting many unimportant things, consists of the following:

Two years assistant professor of chemistry at the Oregon Agricultural College; research assistant, Stanford University, for about a year; four years City chemist of the City of San Francisco; seven years chemist in the Bureau of Science, Manila, P. I., and a part of that same time head of the Chemical Department of the University of the Phillipines. At that same time, for part of the period, I was a member of the Food and Drug Board of the Phillipine Islands.

After this term of service I entered the employ of the Department of Agriculture, Bureau of Chemistry, Washington, D. C., where I remained for five years, after which period I went to E. I. duPont de Nemours & Company for about three years. After resigning that position I accepted my present one.

THE COURT: We will take the morning recess, and I would like to have counsel come into chambers.

(A short recess was taken at this point.)

MR. ANDERSON: I have another matter to bring to your Honor's attention, with regard to Mr. Christiansen's personal notes of his experimentation.

THE COURT: Yes.

MR. ANDERSON: If they are to be submitted to any other chemist or to be given here publicly, he desires some order for protection of his work that any chemist examining those notes shall be required not to make use of them. I see the complication that arises, because that matter was taken up with respect to Dr. Gibbs, your Honor will recall, and I think Mr. Christensen's private notes are entitled to the same protection as any other——

THE COURT: That was one of the matters

which gave me some concern after adjournment last night. My thought on that was this: Their production was called for and I immediately began to consider whether this situation was identical with that which arose before. My first impression was that it was, my second and last impression was that Dr. Christiansen testified he followed literally the process of the patent, and consequently that there was nothing in his notes other than is contained in the patent, and could not be. Consequently, there was nothing to conceal. Is there a flaw in that statement?

MR. ANDERSON: I think there is a flaw, possibly in the matter of precedent, which is my duty to bring to your Honor's attention. Mr. Crossley was on the stand and said he failed to produce some product after experimentation. I asked him what his experiment was.

THE COURT: No, I think not, Colonel Anderson.

MR. ANDERSON: What was it?

THE COURT: Because I was watching as closely as I could to see whether I could allow the answers to go in, and my recollection is that you asked Dr. Crossley how he eventually produced and not his intermediate steps.

MR. ANDERSON: Your Honor's memory is very much better than mine on that and I may be mistaken, but that was my understanding. In any event, I suggest that the laboratory notes of the chemist, which is more than the mere following of a process because it involves technique as well as technical use, that knowledge which is not possessed by us all, is a matter that is valuable to him. However, I have submitted his request to the Court and I must and he must, of course, abide by the rules of the Court.

THE COURT: I do not want him to be under even an erroneous impression that he is not receiving protection. I gave that matter consideration and I did not see the reason for making his notes secret, because he testified he followed the process of the patent.

MR. KRESEL: And neither omitted anything nor added anything. Your Honor will recall you asked him that question.

THE COURT: Yes, I appreciate that.

MR. ANDERSON: That was in his first and second experiments. He then had a great many other experiments, testing both up and down the line for variations or for variance. Now, I understand that counsel on the other side is using a chemist who is a manufacturer of this product. Mr. Christiansen has done a great deal of work and I——

THE COURT: Colonel Anderson, there is no question in my mind as to the fairness of your proposition, and I realized that at the time of the adjournment. My thought was that I would have to make some order on the production of those notes with respect to the protection of Dr. Christiansen. Then I recalled that he had testified, as I understood him, in the 1200 and then in the 600 complete processes that he had followed literally and verbatim the instruction of the patent and had not varied therefrom either by omission or by addition. Consequently I could not see that there was anything to protect. If that was true, I could not see why it was necessary to make either 600 or 1200 experiments.

MR. ANDERSON: I think his statement on that was that he was experimenting in the laboratory and he was not allowed to say why. There was

a good reason for it. He was experimenting up and down, using pure and impure ingredients, for the purpose of testing out these various methods.

THE COURT: So far as the impure ingredients are concerned, his answer to Mr. Kresel was that he deliberately used an impure intermediate at first and still got a usable and safe product.

MR. ANDERSON: Yes, and to the extent that his notes are published, he would not object to it, as I understand it. I am in an entirely new field, so far as my experience goes, and my own view is that when a witness comes into court to testify, unless he is forced in by subpœna, that he must tell what he knows; but I felt that I ought to bring that to your attention, because the witness asked me to.

THE COURT: I am glad you did so.

MR. ANDERSON: He is a young man and I do not want to do him any injury by bringing him here to testify.

THE COURT: I agree with you thus far. This is fundamental and we will take time to point out our difference of views. I do not agree that a person, whatever his occupation or position, should feel "I desire to escape testifying on material matters in a court" and should avoid testifying unless under subpœna. I feel that a court is a place to which a person should come freely and willingly to tell what he knows without a subpœna, with full faith and belief, and knowledge, as far as he can have knowledge, that his rights are going to be fully protected; that he is not going to be abused by counsel, unless his attitude on the stand makes that an inevitable consequence of his own acts, and then not to any material extent; and I do not make any distinction between

a witness who is under subpœna and one who is not, because I think the sooner the citizen of America can be convinced that that is one of the duties of citizenship, the better off the country will be. Mr. Kresel, have you anything to add?

MR. KRESEL: No, your Honor, I have nothing to add.

THE COURT: I think I have indicated by my remarks already what my thoughts have been. I have not been able to see that there is anything to protect, because the patent is public, and his processes made in conformity with that patent were necessarily and consequently public also. But Colonel Anderson suggests that there may be questions of technique. I prefer to err on the side of protecting the witness, so long as I can do so without damage to the issues in the case. So I will ask you to confer with Colonel Anderson with respect to the persons to whom you may and the circumstances under which you may reveal Dr. Christiansen's notes.

MR. KRESEL: I will do that. I have not the notes now. We returned them to Dr. Christiansen, so between now and the time I confer with Colonel Anderson, there is no danger of any revelation.

THE COURT: I hope you will be able to agree. If not, I will make an order in regard to it.

MR. KRESEL: We will certainly try, your Honor.

Q. 7. How long have you now been connected with the Hygienic Laboratory, in this present service?

A. Almost a year; not quite.

Q. 8. I think you testified you had formerly been connected with the Government Laboratory at a former stage, did you not?

A. I have been connected with three Government

laboratories—four Government laboratories; the Government of the City of San Francisco, the Government of the Philippine Islands, the United States Department of Agriculture, and the United States Department of the Treasury.

Q. 9. When were you connected with the Department of Agriculture, Experiment Station or Laboratory, for what period

A. Nineteen hundred and fourteen, the middle of 1914, until the middle of 1919; a little over five years.

Q. 10. In what capacity?

A. I accepted first the position of Assistant Chief of the Eastern District, including the Eastern Drug Inspection District, after which I occupied other positions. I conceived and organized the Color Laboratory of the Bureau of Chemistry, obtaining appropriations for that work for three or four years. Up to the time I left, I was head of the laboratory.

Q. 11. And you left there what year?

A. Nineteen hundred and nineteen.

Q. 12. Where did you go then

A. E. I. duPont de Nemours & Company.

Q. 13. At Wilmington?

A. The company is at Wilmington but my work was across the river at Deep Water.

Q. 14. You mean at the dye plant?

A. At the dye plant.

Q. 15. In what capacity?

A. I was chemist in the Jackson Laboratory, which is the research laboratory.

Q. 16. How long were you there?

A. About three years, I think it was a trifle short of three years.

Q. 17. And you returned from there to the present Hygienic Laboratory, did you?

A. After resigning from the duPont Company, I

accepted the position in the Hygienic Laboratory which I now hold.

Q. 18. Dr. Gibbs, did you ever make or have made under your direction officially any salvarsan or arsphenamine?

MR. KRESEL: Which is it, make, or have made?

MR. ANDERSON: I will ask either.

THE COURT: The second question will probably clear that up. Can you answer yes or no, Dr. Gibbs?

THE WITNESS: I can, yes.

Q. 19. What did you do in that connection, or if you did not do it in that connection, who did it, in connection with the making of salvarsan either by you or under your direction? State the facts.

MR. KRESEL: What time, please?

Q. 20. State the time and the facts as near as you can give it.

A. Some questions concerning arsphenamine, which was then called salvarsan, arose in 1917; and I directed a chemist in my laboratory to begin experimental work on the subject. This man was Dr. James B. Conant, who is now Professor of Chemistry at Harvard University.

Q. 21. What was done, and have you any official report to you on that subject?

A. He completed his experimental work in 1917, and submitted to me an official report upon the subject.

Q. 22. Did he work under your immediate direction?

A. He did, largely in the same room in which I had my office. We were very crowded. It was during the war and we had a great deal of war work; and for the reason that we were crowded, he did a great deal of his work in my own office where there were some

laboratory facilities, and I saw almost all that was done.

Q. 23. Have you his official report to you, as an officer of the Government, of the results of his efforts?

A. I have.

Q. 24. Will you produce it?

A. (Produces paper.)

MR. ANDERSON: Do you wish to see it before I offer it in evidence, Mr. Kresel?

MR. KRESEL: Yes.

MR. ANDERSON: Would you let me offer it in evidence so that I may proceed? I may want to ask some questions about it.

MR. KRESEL: No, I am sorry. I cannot without reading it determine whether I want to raise any objection.

MR. ANDERSON: Very well.

MR. KRESEL: Your Honor, may I ask the witness one or two questions preliminarily?

THE COURT: Yes.

CROSS-EXAMINATION.

By MR. KRESEL:

XQ. 25. Dr. Gibbs, I do not find that this report is dated. Could you tell me at what date it was made?

A. I can tell within a few days. In September, the early few days of September, or the last few days of the preceding month, in 1917. I——

XQ. 26. That is all I wanted.

A. I wanted to tell you in addition that I think it was probably the first day or two in September.

XQ. 27. At that time you were working in the Color Laboratory?

A. I was chemist in charge of the Color Laboratory, Bureau of Chemists.

XQ. 28. Did the Color Laboratory have anything to do with experimenting with salvarsan?

A. We did.

XQ. 29. That was part of the work of the Color Laboratory?

A. It was made part of the work of the Color Laboratory.

XQ. 30. The report consists of two papers. One of them appears to be signed by James B. Conant. The other one does not. When did you first see them?

A. When they were typewritten and handed to me at the time of making them.

XQ. 31. In September, 1917?

A. About that time.

XQ. 32. Did you keep a copy thereof for yourself?

A. No, I did not keep a copy personally. The copy was always in the files of the Bureau of Chemistry.

XQ. 33. After you received it, it was filed away?

A. There were probably several copies made, and there was a copy submitted also to the Chief of the Bureau for his information.

XQ. 34. Were you the Chief of the Bureau?

A. No, sir.

XQ. 35. I say, the copy that you saw or which was handed to you was filed away in the Government archives, is that it?

A. Well, I saw all the copies that were made.

XQ. 36. You did not keep a copy?

A. Personally?

XQ. 37. Yes.

A. Take it away from the Bureau of Chemistry?

XQ. 38. Yes.

A. No, sir.

XQ. 39. Do you know where the copy that was filed has been all this time?

A. This one that you have in your hands?

XQ. 40. Yes.

A. It has been in the Bureau of Chemistry.

XQ. 41. Do you know whether it is the same paper as it was when it was filed there?

A. I do.

XQ. 42. If so, how do you know it?

A. Well, I am very well acquainted with the files employed in the Bureau and in the Color Laboratory from my five years experience there. I know the stenographer that has charge of those things and the paper was taken from the files a few days ago and forwarded to me by mail.

XQ. 43. That is all you know about it?

A. It was forwarded to me indirectly, yes. That is practically all. I may think of some more things.

XQ. 44. The results of experiments of this nature are published, are they not?

A. Dr. Conant——

XQ. 45. Are they or are they not published by the Government, or is it confidential property?

A. I cannot say that they were all published. Some of the things are of little interest. There was a scientific publication prepared embodying the things that Dr. Conant considered and that I considered of scientific interest.

XQ. 46. Well, were they published?

A. The publication was made, yes.

XQ. 47. In what journal?

A. My recollection is, it was in the *Journal of the American Chemical Society* shortly after.

XQ. 48. The result of this very experiment?

A. I do not know what you mean by "this very experiment."

XQ. 49. I mean the experiment of what this paper purports to show.

A. That paper summarizes a large number of experiments.

XQ. 50. Well, have you the publication in the *American Medical Journal*?

A. The *Journal of the American Chemical Society.* I have not a copy with me.

XQ. 51. You have not?

A. No, sir.

XQ. 52. Can you give us the date when it was published?

A. No, I cannot.

XQ. 53. Was it published under Dr. Conant's name?

A. It was.

MR. KRESEL: We will try to find it.

By MR. ANDERSON:

Q. 54. Do you know whether that publication embodied this entire report or not?

A. No, sir, it did not embody the entire report.

Q. 55. Dr. Gibbs, can you identify this report as the report made to you by Dr. Conant?

A. I can.

MR. KRESEL: How?

Q. 56. Do you recognize this as the report made to you by Dr. Conant?

A. I recognize it as the report. I recognize the general form. I recognize the paper of the Agriculture Department. I recognize our stamp index. I recognize Dr. Conant's signature at the end of the report. I recall the circumstances surrounding it.

MR. ANDERSON: I offer in evidence paper entitled "Report on Some Experiments on Methods for Synthesizing Salvarsan," addressed to Dr. Gibbs, on Department of Agriculture, Bureau of Chemistry stationery, which the witness has identified, consisting of five and a half typewritten pages, and signed by James B. Conant, with a note at the bottom "Attached report on work on

salvarsan" and paper attached entitled "Preparation of Sodium Oxyphenylarsonate, Report of Work on Salvarsan" by James B. Conant, consisting of eight typewritten pages, which I will ask to be identified and read in evidence as Plaintiff's Exhibit No. 680.

MR. KRESEL: We object to that upon the ground that it is immaterial and irrelevant, that it has not properly been proven as an official report; and furthermore, the effect of it is going to be, if admitted, that it puts in the one-sided statement of a man who is not presented as a witness and the defendant is deprived of the opportunity to cross-examine.

MR. ANDERSON: If your Honor please, so far as the proof of the report is concerned, Dr. Gibbs has identified it, as an officer of the Government, as a report made to him by one of his assistants or subordinates. So far as the last point is concerned, after Dr. Stieglitz was permitted to testify not only of matters that came to him verbally in his position which he claimed to occupy in connection with various departments of the Government, and also to testify as to what his laboratory assistants had done in the making of salvarsan, although he said he had never made any himself, it seems to me that it is a little late to raise the objection that an official report of the Government, some hundreds of which we have put in here on both sides, cannot be put in without calling the witness who made the report. If we are going to start back there, we will have to start at the beginning.

MR. KRESEL: It is never too late, Colonel. As to what you say about Professor Stieglitz, Professor Stieglitz testified without any objection

from you and did not testify about what any assistant did, but what he personally saw. I have raised no objection to this witness stating what he saw his assistant do. But if you put in a written report of somebody whom you do not present as a witness, and claim that that states the facts, you cannot deny that it deprives us of the right to cross-examine that witness.

MR. ANDERSON: I think I have made that objection some dozens of times and was overruled; and I stopped making them because I supposed that was to be the rule. I suppose there are at least 100 official reports introduced here, of Colonel Joyes and various other people, as to which I stated we were entitled to have the witness cross-examined; and the rule being adopted to the contrary, I have stopped raising that objection.

THE COURT: Of course, the plaintiff is the Government; and those reports coming from the opposite side probably would come in from a little different point of view than if presented by the Government itself. Nevertheless, I am going to resolve this into a question of the weight of this document and not into its admissibility. Now then, whether it will be given more than the very slightest weight under the circumstances, if the persons who made the tests are available, will be a question which I will subsequently determine. I will admit this now and give Mr. Kresel an exception.

Received in evidence and marked "Plaintiff's Exhibit No. 680." (*See Exhibits, Vol. III, page 1732a.*)

By MR. ANDERSON:

Q. 57. Dr. Gibbs, did you ever have any talk with Mr. Garvan about the production of salvarsan under the salvarsan patent?

MR. KRESEL: That is objected to as not proper rebuttal.

THE COURT: As the question now stands, the objection will have to be sustained.

Q. 58. Dr. Gibbs, the Chemical Foundation, the defendant here, is attacking the value of the salvarsan patent on the grounds, among others, that it does not disclose sufficient information to enable those skilled in the art to readily produce the substance. Did you ever have any talk with Mr. Garvan in 1919, on this subject?

MR. KRESEL: Objected to upon the ground that it is immaterial and irrelevant and is not proper rebuttal.

THE COURT: How is it in rebuttal?

MR. ANDERSON: It is in rebuttal, in that it does two things. It answers the entire claim as to these patents and it brings home to the President of the Chemical Foundation the knowledge that this stuff has been produced and that it could be produced under this patent before they ever bought them.

THE COURT: That is a different question. You see, you went into the question of value of the salvarsan patent in chief. Now then, if the salvarsan patent was admitted to have a value by the defendant or some person duly authorized, that would also be part of that. You cannot split your case between chief and rebuttal. So that it is clear to my mind that this question as now put is not in rebuttal. If you want to show, however, the other matters to which you referred in your last remark, I will let you put your question and rule on that.

MR. ANDERSON: In order that I may conform to your Honor's ruling, would your Honor indicate what remark you referred to?

THE COURT: As to the workability of the patent. You intimated in your last statement that you proposed to bring out that Mr. Garvan had made such statements as either expressly or by implication said that the salvarsan could be made under the salvarsan patent.

MR. ANDERSON: I did not say Mr. Garvan—that he was advised it could be made by an officer of the Government under the salvarsan patent.

THE COURT: Your statement is that Mr. Garvan was advised by officers of the Government that salvarsan could be made under that patent?

MR. ANDERSON: By this witness, that salvarsan could be made under the salvarsan patent.

MR. KRESEL: I had understood it to be an elementary rule that you can not contradict a witness without first giving him an opportunity to tell the truth.

MR. ANDERSON: I am not contradicting Mr. Garvan.

MR. KRESEL: Now, wait a minute, please. There was not any question put to Mr. Garvan upon his cross-examination as to whether he had ever had any talk with Dr. Gibbs about this patent. How can they now call a witness and open that question upon rebuttal?

THE COURT: If it is a ground of contradiction, and no grounds were laid during the examination of Mr. Garvan for contradiction—I did not understand, though, that that was the purpose.

MR. ANDERSON: I do not claim that Mr. Garvan said——

MR. KRESEL: If that is not the purpose, then it introduces an entirely new element in the case on rebuttal, and therefore is not permitted. If they have any information that they say was brought to the attention of Mr. Garvan before

this transaction was made, it was their business to put it in on their direct case, not to wait until rebuttal to do that.

MR. ANDERSON: If your Honor please, on our direct case no question was raised as to whether this stuff could be made under this patent. As a matter of fact, we had no information, even in the answer, that such a claim was going to be made in this case.

MR. KRESEL: Our answer shows it.

MR. ANDERSON: We have not raised that point; but as a matter of fact, we further assumed that no such claims would be made in this case for the very good reason that the position of the parties, which I have already indicated, and the acts of the defendant were such as to estop them. That question, of course, is reserved.

Now the defendant, of which corporation Mr. Garvan is President, and therefore he speaks for the defendant, comes into court and says that these things were of no value or of little value on April 10, 1919, because since that time, apparently, they have found difficulties in making the product under the process patent.

Surely, in rebuttal of that line of testimony, of which there is so much that there is no use in referring to it in detail, it is competent, since no proof was made on direct, and that is an entirely original proposition made by the defense, for the plaintiff to come here and show, not only that the stuff could be produced, that it had been produced under the patent, but that an officer of the Government at a time when Mr. Garvan was himself an officer of the Government, before these patents were for sale, and also an officer of the Chemical Foundation who was competent to advise him

and whom he consulted on the subject, advised him that it could be made under that patent.

THE COURT: Is that in general refutation of the defense set up, or is it in contradiction of some specific statement of Mr. Garvan?

MR. ANDERSON: It is not in contradiction of any specific statement of Mr. Garvan, because Mr. Garvan was not asked about it. He would probably have been asked if I had known about it at the time; but he was not asked about it, and therefore I can not say that it is a contradiction of Mr. Garvan. I do not claim Mr. Garvan has said anything on the subject at all.

THE COURT: You may take the answer, and I will consider as to whether or not the answer may be met, if there is an offer to do it, in surrebuttal. You may take the answer, specifying the time, place and circumstances, before the answer is made.

Q. 59. You have heard his Honor's statement. Would you now answer the question?

A. I would like the question again. I do not remember it.

MR. ANDERSON: Read the question, please.

(Q. 58 repeated as above recorded.)

THE COURT: And before you state your answer, specify the time and place and persons present.

A. (To Q. 58) I had a talk with Mr. Garvan on the subject. At the present moment I can not fix the date accurately, and to the best of my recollection there was no one else present.

THE COURT: And the place?

A. (continued) The place was in one of the offices of the Alien Property Custodian in Washington, D. C.

MR. KRESEL: And the time?

A. (continued) To the best of my recollection it was early in 1919; not being able to fix the date accurately.

THE COURT: What difference does it make?

Q. 60. I will now further ask, that if you know of any data by which you can fix the date accurately, that between now and Monday you go to Washington and bring it back here, as I want the exact date if you can get it.

A. If you please, if I do that, I will have to suspend my duties.

Q. 61. That is so. Then go ahead and testify to the best of your knowledge today.

THE COURT: But, Colonel Anderson, can you fix the time as to whether it was January, February, March, or April, or some time thereafter?

Q. 62. State it as accurately as you can, Dr. Gibbs, to the best of your knowledge.

A. I think that I have some papers that will fix the time to the day, and further than that I would not like to commit myself. I think, your Honor, if you please——

THE COURT: As that stands, do you want the answer under those circumstances?

Q. 63. Can you state approximately the month, to the best of your belief, subject to correction if you can find the date?

A. I do not like to commit myself in view of the fact that I may be able to locate the exact day, and it will be a month or two one way or the other.

THE COURT: Do you want his answer before he can do that, for obvious reasons?

MR. ANDERSON: I am going to ask that your Honor permit me to take the answer anyhow. As the witness is engaged in this test business, I do not know whether I can send him to Washington tomorrow; but I am going to try to look up that

date and ask leave, if necessary, when we come to the question of proof of these tests, to introduce the exact date.

THE WITNESS: Can I have the question again?

(Q. 58 repeated as above recorded.)

Q. 64. And I would like to ask if you can now, from your memory, fix it prior to April 10, 1919.

THE COURT: Whether he can fix it from his memory, and if so, when it was.

While he is thinking of that, will you come to the bench Colonel Anderson, and Mr. Kresel?

(Discussion of Court and counsel then ensued at the bench.)

THE COURT: Have you agreed upon your laboratory?

MR. ANDERSON: I do not know, sir.

THE COURT: It may be that the duPont Laboratory is just the place for it.

MR. KRESEL: They were to let me know. I have not heard yet.

MR. ANDERSON: If it is a good laboratory. As soon as we take the adjournment I am going to take all that up and see if we can get together.

THE COURT: Yes.

MR. KRESEL: I understand it is agreed upon to get a room in the duPont experimental station and that all the equipment is being assembled in that room.

MR. ANDERSON: I would like to have the question read to the witness.

THE COURT: I think the witness remembers the question. Can you answer it?

A. I can fix the date as on or before April 10, 1919, and with additional information it is possible I may do it even more accurately than that.

MR. KRESEL: But you mean it was positively before April 10th?

THE WITNESS: I said on or before April 10, 1919.

MR. KRESEL: I do not know what that means.

Q. 65. For the information of counsel will you state how you fix the date?

MR. KRESEL: No, I do not want to know that. All I want to know is whether he now says it was before April 10, 1919.

MR. ANDERSON: He said on or before—either on that day or prior to that day.

Q. 66. Is that correct, Doctor?

A. That is correct.

MR. KRESEL: Very well.

Q. 67. As you recall, at that time only you and Mr. Garvan were present; is that right?

A. That is my recollection.

Q. 68. Will you state as nearly as you can from memory what was said? Not your conclusions, but as nearly as you can what was said, or the substance of the conversation if you can not state the exact words.

A. The substance of the conversation, the bulk of the conversation, was carried on by Mr. Garvan and was to the effect that the patents taken out by German interests in this county——

THE COURT: Just a minute. Isn't this witness going beyond your inquiry?

MR. ANDERSON: Yes.

Q. 69. I will ask you to limit your reply to the matter of salvarsan.

THE COURT: And not the conversation, but what this witness communicated to him, is what I understood was your question.

MR. ANDERSON: Yes, and I supposed he was going to state the inquiry to him and what he replied.

Q. 70. Just what you told Mr. Garvan. It does

not matter what Mr. Garvan said to you, but state what you told him about salvarsan.

A. I told Mr. Garvan that I could not substantiate the contention that the German patents were unworkable from the experience that my laboratory had had with salvarsan.

Q. 71. Did you state anything further; did you tell him what that experience was?

A. I possibly stated that our experiments——

THE COURT: No, do not guess.

MR. KRESEL: I object to what he possibly stated.

THE COURT: You either did or did not. Did you, Doctor?

MR. ANDERSON: Remember or do not remember.

THE COURT: Yes.

Q. 72. Do you remember whether you did state to him the result of your laboratory work?

A. I stated that we had made salvarsan in the laboratory under the German patents. I possibly stated——

THE COURT: No, I do not want "possibly". That indicates you are drawing on your imagination for the information. I want it accurate.

Q. 73. As I understand it, the two things you are prepared to say you did say to Mr. Garvan, on which your recollection is definite, is that you could not sustain the suggestion that the German patents were unworkable because of your experience, the experience of your laboratory, in the making of salvarsan under the German patents, and that you had made salvarsan under the German patent in that laboratory, or it had been made in the laboratory?

A. Yes.

Q. 74. Does that summarize what you know you said?

A. That is correct.

Q. 75. The balance of it you are not sure of. Dr. Gibbs, you saw the experiment which Dr. Stieglitz worked here in the courtroom, did you not?

A. I recall three experiments carried on by Professor Stieglitz.

Q. 76. You were in the courtroom at the time?

A. I was.

Q. 77. Have you ever worked those experiments?

A. I have.

Q. 78. When?

A. When I was a Freshman——

MR. KRESEL: What difference does that make?

MR. ANDERSON: It makes this difference: Here was a great development, and of a laboratory character, that made this thing so important——

MR. KRESEL: Wait a minute.

THE COURT: I did not get that impression, and I have not any objection to stating now that my impression was that it was a pure elementary demonstration of aniline and the different products to be obtained——

MR. KRESEL: From the same base.

THE COURT: That the same base could be used in three different ways.

MR. KRESEL: That is all.

MR. ANDERSON: The impression I got was it was something connected with this dye industry, in connection with these patents. I do not recall the testimony or how it was connected up.

MR. KRESEL: On the contrary.

THE COURT: The only purpose that it had, so far as I could see, was to show that anilin could be used for military or commercial purposes.

MR. KRESEL: Or dye purposes, yes.

THE COURT: And it had no other purpose, as

far as I could see. I have no objection to your taking the answer that he performed that in his Freshman year at college. That is what I think he was saying, was it not?

THE WITNESS: At Cornell.

Q. 79. In your experience, if you as a chemist skilled in the art were given a formula to produce any inorganic compound or medicine for internal insertion into the human body or injection into the veins, and no reference was made therein to the purity of the ingredients, would you as a chemist regard that as an essentially implied condition or not?

A. I would regard it as an essential.

Q. 80. Would you under such conditions use pure ingredients or intermediates, or purify at the various stages?

A. I would.

Q. 81. Are those principles matters of common knowledge and acceptation to those skilled in the art?

THE COURT: Your question is leading.

Q. 82. Can you say whether those principles are common knowledge and accepted by those skilled in the art of organic chemistry?

A. I can.

Q. 83. What would you say about it?

A. They are taught by every——

MR. KRESEL: Well, they are or they are not. Never mind what was taught.

MR. ANDERSON: I think he can say that, your Honor.

THE COURT: No, the question calls for yes or no, Colonel Anderson.

MR. ANDERSON: I asked him what he would say about it. He answered yes, and then I asked him "What would you say about it?" I did not want to lead him; I asked him what he would say on the subject.

MR. KRESEL: I object to what he would say on the subject. I dare say this gentleman could sit here for an hour and talk on the subject.

THE COURT: I do not think the answer to the question helps me a particle, because I have got to determine what is meant by those skilled in the art, and I have yet to determine whether that is necessarily an implied condition in the highly technical patent. The answer will not help me. You can take it, briefly, if you want to, but it won't help me a particle.

MR. ANDERSON: I will ask that he answer briefly. I will ask that the question be read.

(Q. 83. read as above recorded.)

A. The principles involved are taught by every Professor and Instructor in chemistry under whom I have studied. They are well known to the teachers of chemistry and to the students.

MR. ANDERSON: The witness is with you Mr. Kresel.

MR. KRESEL: How late is your Honor going to sit? I am willing to go on or to suspend.

THE COURT: We will adjourn at 12 o'clock unless there is an agreement to the contrary.

CROSS-EXAMINATION.

By MR. KRESEL:

XQ. 84. Dr. Gibbs, if you were writing the specifications of a patent and you knew that if a person followed out those specifications and used impure products the result would be that it would kill the patient, and if you knew that all sorts of chemists, those that are good and those that are poor, tried to carry out experiments according to patents, would you or would you not make sure to say in the patent "Be sure that your product is pure before you start"?

MR. ANDERSON: I object on the ground, if your Honor please, that the only test, as to those skilled or unskilled in the art, is that a man who used impure articles is prima facie and conclusively unskilled in the art—to make that for injection into the veins of a human being.

MR. KRESEL: What sort of an objection is this?

THE COURT: I did not get that.

MR. ANDERSON: And the assumption is not based on any evidence in this case that there is anybody unskilled in the art who ever tried to manufacture under those patents.

THE COURT: I find one difficulty with your question. I do not understand the objection fully, but I find one difficulty with your question, and that is with reference to the use of the word "poor." Instead of that, you might use the words "having only ordinary experience and skill" instead of "poor." You use the expert and "poor" in the question.

MR. KRESEL: I did not mean to say "poor." If it was in the question it was an inadvertence. I will make it those that are skilled and those that are unskilled.

THE COURT: It includes persons who are of ordinary and fair information and skilled in the art. If you want to use those words, reframe your question and I will listen to the objection.

XQ. 85. Dr. Gibbs, if you were writing the specifications of a patent and you knew that a person attempting to carry out those specifications, if he uses an impure ingredient, the product if administered to a human being would kill that human being, and if you also knew that persons of ordinary information and skilled in the art or science, as well as those very

skillful in the art or science would attempt to carry out the specifications laid down in the patent, would you not be sure to put into the patent the warning that no one must carry out the experiment without first seeing that the ingredients were pure?

MR. ANDERSON: I object first on the ground that the assumptions contained in the question are not sound. I notice your Honor has referred to an authority there, and I do not know what the authority is.

THE COURT: Walker on Patents, Section 156, the reference I made the other day.

MR. ANDERSON: All right, but I would say that where chemists were engaged in the manufacture of stuff to be injected into the veins of human beings, that would require persons of more than ordinary or fair intelligence doing that work; because that is a character of work requiring the highest order of intelligence. On the other hand, if you had a man engaged in making material for sprinkling the streets, a man of ordinary intelligence could do it because it would not do anybody any harm if his intelligence was not quite up to the standard for that kind of requirement.

Therefore, while the general principle applicable to all patents may be as laid down, all general principles must have in their application a due regard to the facts and conditions under which they are to be applied.

In the second place, it is not a question what Dr. Gibbs would write into a patent. He may be a very cautious, an extremely cautious man; he may not be an extremely cautious man. He is not drawing a patent The sole question that can be raised here is whether in the opinion of a man who is experienced in chemistry the speci-

fications or the formulae of a patent would be such as to indicate to the mind of a reasonably prudent man, so skilled, the use of pure ingredients or the proper purification of the same at different stages.

It does not matter what Dr. Gibbs would personally do. If that is indicated to a man of skill in the production of drugs for this highly dangerous use and of highly dangerous character by the combinations, the character of the product and the use thereof, then that is the sole question so far as this patent is concerned, and not the personal views of anybody.

THE COURT: I think that is true, but I think your question with reference to those skilled in the art laid the ground for cross-examination of this character. I think there may be some question or some doubt as to the validity of your objection on the hypothesis of this question to the extent that Mr. Kresel has used the words "would kill." I would suggest that the words "might kill" be substituted.

MR. KRESEL: Very well, your Honor.

THE COURT: That is the only difference I know of or that I think of. Do you think of any more?

MR. ANDERSON: I have stated my objections, of course.

THE COUPT: I will let the answer be taken.

MR. ANDERSON: Exception.

A. I would like to hear the question again.

MR. KRESEL: And in the reading of the question insert the words "might kill."

(XQ. 85. read with the above modification, as follows:)

"Dr. Gibbs, if you were writing the speci-

fications of a patent and you knew that a person attempting to carry out those specifications, if he used an impure ingredient, and that product if administered to a human being might kill that human being, and if you also knew that persons of ordinary information and skill in the art or science as well as others very skillful in the art or science would attempt to carry out the specifications laid down in the patent, would you not be sure to put into the patent the warning that no one must carry out the experiment without first seeing that the ingredients were pure?"

A. If I may be allowed to explain, I would first say——

XQ. 86. No. I do not want your explanation at the present time. I would like you to answer the question.

A. No.

THE COURT: Now do you want to modify that?

THE WITNESS: I would, yes.

THE COURT: Very well.

THE WITNESS: I have taken out a great many patents and my experience has been that I tell an attorney what I have discovered and he does the rest.

XQ. 87. Dr. Gibbs, how did you come to go to Mr. Garvan's office on this occasion which you say was either on the 10th of April, 1919, or prior thereto?

A. (Examining paper) Mr. Garvan requested information from me and to the best of my recollection he asked me to come to his office. I say to the best of my recollection. It may have been one of his clerks that asked me to come to his office.

XQ. 88. You say he requested information from you. Was that request made in writing?

A. No, sir; not to the best of my recollection.

XQ. 89. Did you have a personal acquaintance with Mr. Garvan before this visit to his office?

A. I did.

XQ. 90. How long had you known him?

A. I first became acquainted with Mr. Garvan in the latter part of 1918.

XQ. 91. Was your acquaintance with him in the way of official duty?

A. I can place it a little closer. I think it was October. I am not quite certain, but about October.

XQ. 92. Nineteen eighteen?

A. Yes.

XQ. 93. I say your first acquaintance with him was in the course of either your or his official duties?

A. It was.

XQ. 94. At that time you were with the Department of Agriculture attached to the color laboratory?

A. I occupied several positions at that——

XQ. 95. No, were you with the Department of Agriculture in the color laboratory on this occasion when you first met Mr. Garvan?

A. I was in conference with Mr. Garvan the first time——

XQ. 96. Can't you answer that question?

A. In my official capacity representing the Bureau of Aircraft Production, a branch of the War Department.

XQ. 97. Then you were attached to the Bureau of Aircraft Production?

A. I was.

XQ. 98. At what time?

A. From about that time in 1918, as I recollect——

XQ. 99. October?

A. I am not sure. I think my connection began before that. Until the end of the war. I was loaned to the Bureau of Aircraft Production on part time by the Department of Agriculture.

XQ. 100. You mean from October until the Armistice?

A. I can not fix the exact date. They are matters of record, though.

XQ. 101. But was it after the Armistice?

A. Oh, after.

XQ. 102. You said after the war?

A. It took me some time to finish my work there.

XQ. 103. When you had the talk with him on the 10th of April or before that were you then with the Bureau of Aircraft Production?

A. I was, part time.

XQ. 104. Were you putting in any of your time in the color laboratory?

A. I was.

XQ. 105. So that your recollection is that either Mr. Garvan personally or someone from his office asked you to come to Mr. Garvan's office?

A. Yes, sir.

XQ. 106. And that that communication was not in writing, is that right?

A. To the best of my recollection.

XQ. 107. And that you then went over there?

A. Yes, sir. In fact, I am almost positive it was not in writing. We were telephoning our business mostly at that time.

XQ. 108. Have you a clear recollection of the entire conversation you had with Mr. Garvan?

A. Not at the present moment.

XQ. 109. Is the only thing that you clearly recall what you have said on the direct?

A. No, sir.

XQ. 110. Will you now give us all of the conversation with Mr. Garvan on this occasion that you can recall?

A. Well, Mr. Garvan asked me for a little help occasionally, now and then.

XQ. 111. That was not the conversation on this occasion, was it?

A. Yes, sir; that was his request.

XQ. 112. You do not understand me. I do not want to know what he asked you on other occasions; I am speaking of this particular occasion as to which you testified on your direct.

A. On this particular occasion——

XQ. 113. Now, we can not both talk at the same time, Doctor. I want to know the entire conversation on that occasion.

A. I have not been able to fix that occasion definitely. We had several conversations and they were upon different subjects.

XQ. 114. Dr. Gibbs, I do not want to misunderstand you and I do not want to confuse you. You have testified on the direct to a particular conversation, have you not?

A. I have.

XQ. 115. You have not been able to fix the exact date, but you say it was either on the 10th of April or prior thereto. That is correct, is it not?

A. Yes, sir.

XQ. 116. That is the occasion and that is the conversation that I am now questioning you about. I want you to tell me the whole of the conversation.

A. I am afraid my recollection won't permit me to do that, because I think in one week——

XQ. 117. I do not want your reasons.

A. (continued) I saw Mr. Garvan several times.

THE COURT: Strike out the reasons, and all of the answer after "because".

XQ. 118. I do not want your reasons. Can you recall anything else that was said either by you or Mr. Garvan on this occasion in addition to what you have testified on the direct?

A. May I state that I can recall——

XQ. 119. Can you or can you not?

A. Can I explain this?

THE COURT: You can, of course, say yes or no; and then if there is any explanation to follow, we will hear that. You either can remember it or you can not.

THE WITNESS: I will say no, with the explanation that there were several conversations, and what occurred at this conversation, and what occurred at this conversation or the other conversation, I can not testify to. I remember seeing Mr. Garvan several times in the same week.

XQ. 120. Then it follows, does it not, that the conversation that you undertook to give upon your direct you can not fix the date of?

A. Not any more accurately at the present moment than I have already done.

XQ. 121. Were all your conversations with Mr. Garvan before the 10th of April, 1919?

A. To the best of my recollection they were.

XQ. 122. You now say, do you, that you have had no conversation with Mr. Garvan later than the 10th of April, 1919?

A. I can not recollect any.

XQ. 123. Well, can you recollect positively that you did not have any conversation with him after April 10, 1919?

A. I am almost certain that I did not.

XQ. 124. Then you are willing to swear now, are you, that although you cannot fix the exact date, the conversation that you testified about on your direct positively took place either on the 10th of April or before that date?

A. Yes, sir.

XQ. 125. What?

A. Yes, sir.

XQ. 126. Tell me, if you will, how many conversations you had with Mr. Garvan?

A. I think about five or six—four, five or six.

XQ. 127. Can you give me the date of any of them?

A. Yes, sir.

XQ. 128. Please do.

A. April 10th is the date of one, 1919.

XQ. 129. Please stop there a minute. I notice you have referred to some paper that you hold before you, after reading which you said April 10, 1919 was one of them. I should like to see that paper.

MR. ANDERSON: No objection.

A. (Witness hands paper.)

THE COURT: Mr. Kresel, when you reach a convenient point, or when you finish this point, if you find it convenient, we will adjourn.

XQ. 130. Without stopping to read this entire letter, Dr. Gibbs, doesn't this letter show that you did have on the 10th of April, 1919, a conversation with Mr. Garvan about the German patents?

A. I have not read that letter—I would like to read it again before I answer that. I have read it, but I do not recall what is in it.

XQ. 131. You are positive you had a conversation with him on the 10th of April?

A. Yes, sir.

XQ. 132. Isn't that the conversation as to which you gave testimony on the direct?

A. I have not undertaken to fix the date any closer than on or before April 10th.

XQ. 133. I know you have not and I am trying to get you to fix——

A. (Continuing) If it was before, it was not that conversation.

XQ. 134. What was that?

A. (continuing) If it was before April 10th, it was not that conversation.

XQ. 135. I do not follow you, but perhaps that is my fault.

(No answer.)

MR. KRESEL: Does your Honor desire to stop now?

THE COURT: You may finish this point, if you wish, and then we will adjourn.

MR. ANDERSON: I am ready to adjourn, but I understand you wish to ask some more questions.

MR. KRESEL: No, I do not think I want to ask him very many more questions.

XQ. 136. As you sit there, Dr. Gibbs, your mind is a perfect blank as to anything Mr. Garvan said to you or you said to Mr. Garvan on the occasion as to which you testified on the direct, in addition to what you did say on the direct; is that correct?

A. No—I would like to have that read, please.

(XQ. 136 repeated as above recorded.)

THE WITNESS: I do not understand the last part of that at all.

XQ. 137. Perhaps it is a little involved. I say, your mind is a perfect blank as to anything that Mr. Garvan said to you or that you said to Mr. Garvan except what you have already testified to on the direct?

A. At any conversation?

XQ. 138. No, I mean that conversation?

A. No, it is not.

XQ. 139. Then at least tell us what else you recall as to that conversation?

A. Well, I started to make a few remarks as to my recollection concerning what Mr. Garvan said to me.

XQ. 140. Well, go on; I have been asking you to give it to us.

A. Mr. Garvan introduced the subject of the American patents that were German owned, and while I can only remember in a very sketchy way what he

said, the substance of it is the same as he has made in speeches on many occasions, referring to the non-workability and questions of seizure and use in this country and general questions of that description——

XQ. 141. Wait a minute.

A. (Continuing) And that called forth my remarks concerning——

XQ. 142. Wait a minute, Doctor, please; I have got to interrupt you. I do not mean to interfere with you. You have said——

MR. ANDERSON: I object. Let him finish his answer.

MR. KRESEL: Now wait a minute.

XQ. 142. (Continued) You have said that he made the same remarks that he made in speeches about the non-workability or the seizure. Don't you see that does not give us any information? What did he say?

A. Well, I can only say in a very rough way the substance.

XQ. 143. Do it the best you can.

A. That he had understood that these patents were designed to conceal information and that they were taken out for the purposes of obstruction of American industries, and that possibly—I guess he stated pretty positively that most of them were not workable, or words to that effect. I cannot give it much more in detail; but that was the reason for my——

XQ. 144. No, no. I do not want to know your conclusions. What did he say? What did you say?

A. I said then that I could not bear out such contentions regarding the non- workability from the experience of my laboratory on arsphenamine.

XQ. 145. And then you told him what your experience had been?

A. I—yes.

XQ. 146. Well, that is what you said on your direct. You do not want to take that back, do you?

A. I want to say that of course I did not tell him what our experience had been as I would talk to a chemist. I just merely stated it so that he could understand it.

XQ. 147. What did you say to him?

A. That we had made salvarsan in the laboratory according to the German patents.

XQ. 148. You said that to him positively? Now, there is no question about that?

A. Oh, yes, there is no question about that.

XQ. 149. Now have you given us your best recollection of your entire conversation; what he said and what you said?

A. Yes, I have at the present moment.

XQ. 150. You made no memorandum of that conversation?

A. I would not like to state as to that point. I may have. It is possible that a memorandum concerning it may be filed; I do not know.

XQ. 151. If you find such a memorandum, I assume you will produce it?

MR. ANDERSON: I am going to ask the witness to hunt for the memorandum and see if he can find it. That is the reason I want him to go down tomorrow; but he cannot on account of his other duty; and search through his private papers.

THE COURT: He may be able to get away before Monday so as to come back here by Monday noon.

MR. ANDERSON: If he is, why, we will do it.

THE COURT: And when the experiment is completed, the Marshal will keep his men in charge of the office, and then on Monday morning the product produced may be obtained from

the laboratory, wherever produced, by the four chemists. That means that Dr. Gibbs must be here then.

MR. ANDERSON: Counsel called for a copy of letter dated April 10, 1919, produced by the witness, to show what evidence he had of a conversation of that date. I would like to ask leave to put that letter in evidence.

THE COURT: The calling for it by Mr. Kresel does not give you the authority to introduce it, because the counsel has the right to examine any memorandum which a witness may be directed to produce.

MR. ANDERSON: That is the reason I said I would like to introduce that in evidence, if there is no objection.

MR. KRESEL: It is simply for the purpose of showing that there had been a conversation. That is all that I wanted that letter for. Otherwise it is absolutely immaterial and irrelevant and refers to entirely different matters.

THE COURT: Consider that and do it on Monday.

MR. ANDERSON: Yes, sir.

MR. KRESEL: Now, may I inquire of counsel before the Court adjourns, as to whether the Government is through now or whether it proposes to present other witnesses?

MR. ANDERSON: It does propose to present other witnesses on Monday, within the regulations laid down by the Court. In addition to that, I have already asked for the production of the books of account of the Calco Chemical Company, showing their experimental cost. I would like to ask for the production of Dr. Crossley's notes on his efforts to produce the drugs as to

which he testified here, which were cinchophen, neo-cinchophen and novocain, on Monday morning, or to-morrow, if they are available.

I think it is proper at this time to make another motion that I am going to make and state the purpose of, because I do not think it is necessary to go through the form of examining somebody if the witness's evidence would not be allowed when he comes here, and that is this: I now move the Court that a subpoena duces tecum be issued to the President and Treasurer of the Atmospheric Nitrogen Company, which the evidence shows to be operating a plant for the production of synthetic ammonia at Syracuse, and to the two persons who Dr. Parsons testified were the two persons that knew of the catalyst there produced, requiring them to attend before this Court on Monday, to testify to the exact process being followed, and to the method of production of the catalyst so-called, and to compare such process and such catalyst and the methods of production of the same in detail with the patents introduced by Dr. Parsons, 58 in number, or so many thereof as may be applicable to the process or patent, for the purpose of pointing out in detail the variations, if any, in such process of manufacture, and in such catalyst from that prescribed in these patents.

At the present time I am unable to give the Court the exact names of these officers, but I will get them, and if the subpoenaes are issued, I have a special agent of the Department of Justice ready to take those subpoenaes and serve them between now and Monday morning, and require the production of those papers on Monday, and of this testimony.

MR. KRESEL: This grand-stand play, your Honor——

MR. ANDERSON: Now, if your Honor please, we have had a good deal of that sort of thing.

MR. KRESEL: Yes, you are going to have more.

MR. ANDERSON: And I think, if counsel wish to object to the motion, I want to ask the Court to protect me as a member of the bar, from comments of that character, from which I cannot protect myself.

MR. KRESEL: I am going to let the Court know —if your Honor will permit me; now, this is going to be a matter of personal privilege here between Col. Anderson and myself, and I think I am entitled to as much as Col. Anderson is, and I know your Honor will extend it to me. This business of saying in open court that he wants a subpoena issued on the last day of his rebuttal, I say is nothing more than grand-stand play because——

THE COURT: Well——

MR. KRESEL: He has had seven weeks in which to do that.

MR. ANDERSON: Now, if your Honor please, I must interrupt.

THE COURT: I am going to get you——

MR. KRESEL: And I have no objection to any subpoena going out. I have nothing to do with it. That is within counsel's privilege. He does not have to move for the issuing of a subpoena.

THE COURT (interrupting): Is there anything to be said as to why the testimony if produced under subpoena duces tecum would not be admissible?

MR. KRESEL: I have nothing to say about that. When the testimony is produced, Your Honor, I think that is the time to take any objection.

THE COURT: Your request specifically is what, Col. Anderson?

MR. ANDERSON: Is for a subpoena against the officers of the Atmospheric Nitrogen Company, its appropriate officers, and I will try to get their names and give them to the Clerk this afternoon. Under the statute I can only issue that subpoena with your Honor's order.

THE COURT: I think that perhaps should be by written order, should it not, Col. Anderson?

MR. ANDERSON: Yes, sir.

THE COURT: On petition?

MR. ANDERSON: Yes, on motion or petition. It does not say how the proceeding shall be. The statute says that they can be summoned by order of Court. The usual practice which I have followed in asking for the examination of a witness residing at a distance of more than 100 miles, has been either a personal request or a motion in Court. I have never filed a petition.

THE COURT: I think the records in the Clerk's office should disclose the basis for the issuance of the subpoena duces tecum. I have forgotten the exact phraseology of the statute, Montgomery on Federal Procedure.

MR. ANDERSON: The statute is a very recent one, your Honor.

THE COURT: Yes; but I think the recent edition of Montgomery affords us some help. Before issuing that, Col. Anderson, I am going to ask you to point out just now, so that you can embody it in your petition later, the grounds upon which from your standpoint such testimony, if and when produced, would be admissible and relevant.

MR. ANDERSON: I will be very glad to do that, sir. The first ground is this: The attack has been made upon the Haber patents, so called (I will use

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that expression for identification) on the ground that they do not disclose adequate information for the production of ammonia by the synthetic ammonia process that is embodied in those 58 patents, including the patents covering the catalyst construction.

THE COURT: Is there any evidence in this case to show when they began to manufacture? When, as a matter of fact, do you contend that they began to manufacture?

MR. ANDERSON: You mean whom, now, your Honor?

THE COURT: The persons for whom you desire the subpoenaes issued.

MR. ANDERSON: The evidence is that the Semet-Solvay Company which now, according to the evidence, controls, with the General Chemical Company, was a licensee of the Federal Trade Commission; that the present Atmospheric Nitrogen Company is controlled by the two companies, General Chemical and Semet-Solvay, which are both subsidiaries of the Allied Chemical. Now, the beginning of the manufacture——

MR. KRESEL: There is no evidence of that, your Honor.

MR. ANDERSON: The beginning of the manufacture, if your Honor will permit me, according to Dr. Parsons' testimony was, I think—I will not be sure without reference to it—in the summer of either 1920 or 1921, when he said when the plant began operation he severed his connection with the plant.

MR. KRESEL: That was August, 1921.

THE COURT: How can that be material if produced? There is no evidence, is there, that there was any production under the Haber patents in

America prior to their transfer on April 10, 1919, and as I recall the testimony, the Sheffield Plant No. 1 had proved a practical failure prior to April 10, 1919.

MR. ANDERSON: Under a modified process?

THE COURT: Under a modified process, but which I assume was in the view of the Government and its advisers a more practical process than the pure Haber process, or it would not have been used. Would that not be an inevitable practical conclusion?

MR. ANDERSON: I think so, upon the evidence in this case, sir. I think the more natural conclusion to draw from it was that at that time the General Chemical Company had been experimenting in an effort to produce atmospheric nitrogen in the slightly modified manner from that described in the Haber process; and they proposed to give to the Government, for the consideration named, the use of their experimental work and of their employes, and represented their belief to the Government, which was undoubtedly their honest belief—I do not question that—that they could produce a plant down there that would produce synthetic ammonia by their modified process. With that experience and the need for synthetic ammonia, the Government contracted for this plant.

It is quite a complicated state of facts and involves a great many papers; and therefore, I do not undertake to go into details. That was, as Secretary Baker said, a variation from the German process. The German process on the contrary, while it may have been a variation—I think with the patents in evidence here, I can probably show to your Honor that it was even in its

variation probably an infringement of the Haber process. Then the General Chemical Company or its subsidiary, the Atmospheric Nitrogen Company, constructed a plant in the light of their experience there——

THE COURT: In the light of what?

MR. ANDERSON: In the light of experience down at Sheffield Number 1—constructed a plant at Syracuse, which has been claimed to be a modification of the Haber process and which is claimed to have been successful from the moment it began operation. Now, I have tried to get from these witnesses that came here to tell us about that modification, what the modification was.

MR. KRESEL: And you closed Dr. White's mouth. Dr. White said he would give it to you, but you pleaded the privilege of the United States.

MR. ANDERSON: To the contrary, his opinion related exclusively to information at Nitrogen Plant No. 1.

MR. KRESEL: Certainly.

MR. ANDERSON: And under the contract with the General Chemical Company, as I construe it and as the Government construed it, and as I was advised to construe it, I had to do what I was told.

THE COURT: My difficulty is this, Colonel Anderson. Certain attempts had been made in America and certain facts were associated with the Haber patents, or certain viewpoints existed in America with respect to the Haber patents on April 10, 1919. One of the things that happened then and one of the things that stood out prominently, it seems to me, Colonel Anderson, on April 10, 1919, with respect to the Haber patents, was, as I understand the testimony now, and for the purposes of your application, a practically

complete failure. Whether, under subsequent development, without expense or without time, or with much time and much money, somebody has found a method of improving on that plant, which might or might not come under the process of the Haber patents or some of them, if that has been developed, what effect would that have?

Mr. Anderson: I was going on to answer just that question. It would have this effect. If your Honor is going to decide and if the courts are going to decide this issue, if it becomes an issue in the case, on the conditions as they existed on the 10th of April, 1919, or the dates of the several conveyances thereafter as to those patents, then it might be that all this evidence, including the development of a successful system in America on a modified scale afterwards would be utterly immaterial. But I can not tell what the courts are going to decide; and therefore, if your Honor will allow me to finish the answer to the first question, if I do not interrupt your Honor's thought, if the Atmospheric Nitrogen Company has taken out a license under the Haber patents, as the evidence here shows, paying $2500 for it, and then, protected by that license, proceeds to manufacture atmospheric nitrogen or synthetic ammonia without trouble and without difficulty, and when the value of the Haber patents is challenged, comes in and says, not through its own witnesses but through others, that these processes they are now using are different, then it becomes a matter of the most profound importance to show where that difference comes in, or whether they are really manufacturing under the Haber process and calling it another process. Nobody can tell but themselves. Nobody but themselves can

tell, because it has been testified here that they did not allow even their own engineers in the plant.

THE COURT: Let me ask you this: Mr. Metz testified that the salvarsan patent in his opinion was worth a million dollars and that he would have been prepared, at the time of the sale, to have given a million dollars for it had he had the opportunity. So that in chief you went into the value of the patents, did you not?

MR. ANDERSON: Of that patent; yes, sir. But they having bunched all those patents and sold them, I can show the value of each of them. Some were never mentioned. We have split them up. The Haber patents are a distinct group of patents and could have been sold separately and distinct from all of the others. Therefore, their value becomes important.

THE COURT: You did not go into it because Dr. Holdermann testified with respect to the value of the Haber patents. I deny the motion because I think the testimony called for is not in rebuttal. I deny it now so that it may be on the record. I have no doubt whatever about it.

MR. ANDERSON: I am glad your Honor feels that way, of course; but your Honor will allow me an exception.

THE COURT: Certainly.

MR. KRESEL: Before your Honor adjourns, this question of Dr. Christiansen's notes has not been settled.

THE COURT: I have this suggestion to make, unless you have something to suggest.

MR. KRESEL: I have no suggestion to make.

THE COURT: Dr. Christiansen's notes, even though he testified that all his experiments were in

strict accordance with the patent, must be kept as secret as it is possible, so that the assets that he has therein, which asset constitutes in part at least his personal capital must not be prejudiced by their use in Court any more than is absolutely necessary.

Without any reflection upon anybody, because you understand there is no reflection in these examinations, but it reduces the chances of disclosure if the inspection is restricted, I would make this suggestion: That he submit these notes to one of these two persons: Dr. Stieglitz or Dr. Bolton, which ever you prefer, but not both; Dr. Stieglitz being a man engaged at a University and not being in a position where he would be called into a manufacturing plant. Dr. Bolton is engaged in the manufacture of dyes and not pharmaceuticals, so I think in each of these instances there is a protection to Dr. Christiansen which he would not otherwise get.

Mr. Anderson: Without raising any unpleasant question, I hope your Honor will understand me when I say that I feel constrained on behalf of this gentleman to submit to your Honor a request that the matter be further limited, without making any objection to persons. I have no objection to Dr. Bolton in the least, having any information that we have of any kind or character. I am perfectly willing to have submitted to Dr. Bolton, who I believe to be a very high type of scientist, any information we have.

The Court: Will both counsel please come to the bench?

(Consultation between Court and counsel.)

Mr. Anderson: There is one other matter. This morning we had up the question of this ex-

perimental production of salvarsan. We would like to have two chemists do that separately with the right to select a number of examples of the patents introduced here and produced under any or all of them as the case may be. But it would probably take some time to fix that and my suggestion is to adjourn now and take it up after lunch.

THE COURT: I will discuss that with you when we come back at a quarter of two. We will take a recess until 1.45. That does not mean any afternoon session. But something may come up at our conference which will need to be done in open court.

(Recess until 1.45 o'clock P. M., standard time.)

AFTER RECESS.

THE COURT: We will re-convene in chambers as if in open Court.

Now then, Dr. Gibbs, I will get you to make your inquiry if you wish to.

MR. GIBBS: For the purpose of the record, we desire to ask instructions. A question has arisen concerning the members of the committee, and Dr. Joyes has raised the question that he is going to act on this committee for a short time only, and then he is going to be replaced by Dr. Crossley. My understanding was not such, and I would like to have information concerning the subject.

THE COURT: That was not my understanding but that the experiment would be delayed until Dr. Crossley's arrival, which will be about 4 o'clock, for this reason, that even if the observers would be numerically balanced, yet the two would not see the same things yet it might in a sense

be considered cumulative; so I think we will wait until Dr. Crossley arrives, unless you want Dr. Joyes to go through entirely.

MR. KRESEL: I think so. We had better have Dr. Crossley. Then we will wait until he arrives and Dr. Joyes will not take part in it, and there is no reflection on him.

MR. GIBBS: Then I understand your Honor, the only four people who are to be present are the experimentor, Dr. Bolton, Dr. Crossley and myself.

THE COURT: Dr. Bolton is going to be one of the observers for the defendant, and Dr. Gibbs for the Government and Dr. Crossley will be the other one for the defendant. The experimentor, Dr. Freedman, will be the other one for the Government. Now Dr. Alleman of Swarthmore, none of you observers take any part in the experiment. You simply see what goes on without making suggestions. If there is a departure from the patent, for instance, you permit it to go on, but make a note of those facts so that they can be testified to. There is no objection so far as I can see to the inquiry, I suggest this now, to see how it sounds, rather than to make sure of its being right—if some of you think that Freedman has inadvertently made a mistake in measurement or in temperature, I see no objection to anybody calling his attention to that omission. I think, though, on the contrary, all you observers had better keep still and let him make the experiment all by himself, and then let him testify precisely what he did do. That is, if he makes a mistake, let it pass, and let him make the experiment and you people take notice.

MR. ANDERSON: I think the experimentor in a case of this kind should be allowed to carry on

all three experiments at once. In other words, with one experiment, he can carry forward others. I notice in some of the cases they have as many as five, and in some, three. He can carry on all these experiments in his own discretion, as to a reasonable number of them.

THE COURT: I shall have no objection to that so long as it strictly follows the patent, because I assume it may be possible that one might go wrong for some reason and an accident come at the end of it, and then he would have to start all over again.

MR. ANDERSON: I understand that is the usual practice in such cases.

THE COURT: Then he may conduct as many as three experiments at the same time, if he so desires. What is the name of that acid—peruvic. At the same time, let him make that peruvic acid; but if he does not make the peruvic acid which he makes in his cinchophen experiment, he may use such as he desires in that.

MR. ANDERSON: He can use either as he may propose.

THE COURT: Yes.

MR. GIBBS: May I suggest the additional instruction that none of the observers be permitted to return or make any objections to any of the chemicals employed, on the ground that they were not sure as to the nature of the chemicals that Dr. Freedman employed. We are supposed to assure ourselves that the chemicals he uses are as stated by him.

THE COURT: No. That is not correct. You are all to know whether the chemicals employed by him are the chemicals called for by the patent, in quantity and quality, if I can put it that way—the quality called for by the patent, and the quan-

tity called for by the patent. That is, if you find they are not that, you make a note to that effect and so testify; and you may examine and test those ingredients and the final product in any way you like.

MR. GIBBS: Do I understand that we can not come back and say that we did not know what they were?

THE COURT: You have to know what they are. I am going to ask you.

MR. KNIGHT: Will the stenographer be present?

THE COURT: No. You make your own individual notes, and the Marshal will permit the five chemists to be in the laboratory together, only, unless one of you happens to want to go out for a few minutes and leave the other in. I think there had better be no act done then during that time.

MR. ANDERSON: I have no objection of any kind, but he could not suspend the chemical procedure.

THE COURT: I think probably that would not happen.

MR. BOLTON: Those chemicals have been ordered from the house of Merck in New York. It is quite possible that these chemicals may not arrive today. He is expecting a telegram. He has ordered the kind and quality he wants, and to which he has been accustomed in the past. There is also another uncertainty. The equipment which we have at the experimental station may not be entirely suitable. If that equipment is unsuitable, I do not just know to where we can turn to carry out these experiments, because I doubt whether the University of Delaware would be as well equipped to carry out that kind of work as our experimental station.

THE COURT: I do not think so.

MR. BOLTON: If unable to carry out the experiments there, where shall we go?

THE COURT: How is your laboratory, Dr. Alleman?

DR. ALLEMAN: We have a very fine equipment, but they may wish some special materials in that we have not in there. That is the answer.

MR. ANDERSON: Have you vacuum pumps?

DR. ALLEMAN: What kind of vacuum pumps?

MR. GIBBS: For chemical work.

DR. ALLEMAN: Yes.

MR. KRESEL: The probabilities are, so far as the equipment is concerned, you have all that in your laboratory.

DR. ALLEMAN: Ordinary equipment, yes, sir.

MR. KRESEL: But so far as chemicals are concerned, you may not have them all.

DR. ALLEMAN: I do not know what you require, but we have a very good stock there.

MR. KRESEL: Suppose we try that laboratory first?

THE COURT: That might be a good solution.

MR. ANDERSON: I will go right over the materials with the Doctor now.

DR. ALLEMAN: We have not large quantities of peruvic acid, I will tell you that.

MR. BOLTON: Have you benzaldehyde and aniline?

DR. ALLEMAN: We have carboys of that, carboys of stock with the original seal on.

THE COURT: I suggest the experiment be carried out in your laboratory, Dr. Alleman?

DR. ALLEMAN: Very glad.

MR. ANDERSON: Get in a car, and go over there. That laboratory will be entirely agreeable to us.

I would like, outside of the limit of your Honor's instructions as to the conduct of the proceed-

ings, and as to the evidence which may be suitable or satisfactory to your Honor, I am perfectly willing to leave to these three gentlemen, their broad discretion, with the consent of the experimentor.

THE COURT: That will be entirely satisfactory. Unless it has been satisfactorily arranged with regard to the experimental laboratory, I prefer that you do it at the Swarthmore laboratory of Dr. Alleman.

DR. ALLEMAN: You understand that I do not know that we have everything you require, your Honor?

THE COURT: I understand that.

MR. BOLTON: I have a list of the apparatus.

THE COURT: You can take that up with Dr. Gibbs and you can take anything from the laboratory that you want that will supplement what Dr. Bolton wants.

MR. BOLTON: I think so, yes, sir.

THE COURT: Then I will leave it like that.

MR. BOLTON: Pardon me for interrupting you. I want to state it will be necessary for us to make arrangements if we work at the station, to have brought to us whatever food is necessary, and ask your indulgence to begin the work and stay with the experiments until finished. They may not be finished until tomorrow afternoon, that means working through the night, but that is entirely satisfactory to myself.

THE COURT: I think you had better go to Swarthmore.

MR. ANDERSON: Any expense these gentlemen incur we will be very glad to deal with in the same manner as we have in other cases. We are quite authorized to incur expense, so far as we are concerned.

THE COURT: Yes, you can just let me know what that is, and that will be taxed as part of the costs, I mean to be allowed to you as part of the costs. Anything else I can do. Doctor, if there arises any doubt at any time, you just tell them what to do, I mean as to any detail that comes along.

MR. KRESEL: Dr. Crossley has arrived, they tell me. Come in, Dr. Crossley.

THE COURT: Now we are all here except Dr. Freedman, please bring him in.

MR. ANDERSON: I think I may have stated this in the record, that Dr. Freedman is entitled, and it is his duty to the Court, to be satisfied that his materials, his equipment, and conditions of work, and all the other factors are to his satisfaction before he starts his work and during the time of his work, so that if he does not get his materials in time, he is at liberty to defer until he does get them. I think it was also stated here that he was at liberty to carry on three experiments at once, so that he should not have to start all over again if one failed.

THE COURT: And at the same time to make the peruvic acid for us at the same time.

DR. FREEDMAN: I will try to make that acid, your Honor. I require an iron retort. I will try to make it otherwise.

THE COURT: Do what you like about that.

DR. ALLEMAN: Dr. Freedman, we have a pot like this, that will hold two leaders. I wonder if this would satisfy your requirements? You can make an iron retort out of it quickly. It is not an ordinary iron retort. (Illustrating.)

DR. FREEDMAN: What is it made of?

DR. ALLEMAN: Cast iron.

DR. FREEDMAN: That is all right.

THE COURT: I would suggest before he begins, that Dr. Freedman is satisfied that he has everything and will not have to stop in the middle of it, because we might wonder why he stopped.

MR. ANDERSON: Satisfy yourself, Dr. Freedman. You have everything ready before you go through, and you are not required to use this peruvic acid, or whatever it is that you make, if you can get it satisfactorily from some other source.

DR. FREEDMAN: I understand that.

MR. KRESEL: May I make this observation, your Honor: Dr. Crossley tells me that Dr. Freedman was with the Calco Company for two years, and of course during his employment he gained certain information which he ought not to be at liberty to divulge. Of course our understanding is that he is going to follow the patent.

THE COURT: Yes.

MR. KRESEL: Because as long as he follows the patent nobody can complain, and he is not divulging any information. I think that the observers should be instructed to observe carefully, so that if Dr. Freedman does deviate from the specifications in the patent, that they make proper note of it and report it to the Court.

THE COURT: How many copies of the patent have you?

MR. BOLTON: I have one.

THE COURT: Will somebody supply Dr. Alleman with a copy?

MR. KRESEL: Dr. Alleman ought to have a copy. I have a photostat copy in my bag which I shall give Dr. Alleman.

DR. ALLEMAN: Judge Morris, there is one thing: You made the suggestion that no one was allowed to enter this laboratory. We have a fire

inspection every hour at night. We could seal certain rooms in that laboratory.

THE COURT: There is no difficulty on that score if you will point it out to the Marshal who will go along. Thank you very much, Dr. Alleman.

THE COURT: Mr. Stenographer, you had better note this: I understand from Mr. Kresel that possibly some of the cards which Mr. Christiansen handed to him this morning had been made public, and that you have no objection to anyone seeing those particular cards?

MR. CHRISTIANSEN: I have no objection at all.

THE COURT: Now then, can you separate those cards? There are certain other cards the contents of which have not been refused by you generally.

MR. CHRISTIANSEN: There are.

THE COURT: Can you separate those cards into those two classes?

MR. CHRISTIANSEN: I could if I had reference to my other data in the laboratory, which has a record of the experiments which I have incorporated in all my papers. I have thirteen papers out in the Journals and it would be a matter of little time to check through and find out which experiments had been put into them and which experiments had not.

THE COURT: How long would that take?

MR. CHRISTIANSEN: It would not take very long if I had my other——

THE COURT: You have not them?

MR. CHRISTIANSEN: I have not them with me.

THE COURT: We are trying to get through on Monday and we must get through on Monday.

MR. CHRISTIANSEN: Your Honor, the experiments to which I refer are of no value as practi-

cal experiments. They are interesting from the standpoint of the theory of chemistry only.

MR. KRESEL: What experiments do you refer to?

MR. CHRISTIANSEN: I am referring to unpublished experiments. They are interesting from the standpoint of chemistry, and if I had a definite promise that the chemist who examines my work will never try to incorporate the results of those unpublished experiments into any paper which he publishes, I am perfectly willing he should have everything.

MR. KRESEL: May I ask a question? I am trying to get to an understanding. Is the unpublished part of your work the latter part of the work or the first part of the work?

MR. CHRISTIANSEN: Mainly in the latter part, but there is some scattered throughout all my work.

MR. KRESEL: I was thinking that I would forego examining your latter part of the work if you could release to me the stuff that you had really published. Cannot you by sitting down and looking over your notes, separate them?

MR. CHRISTIANSEN: I can do so.

MR. KRESEL: Substantially?

MR. CHRISTIANSEN: Substantially.

MR. KRESEL: Suppose we try that.

THE COURT: Do you see any objection to that, Col. Anderson? I am asking you now as an officer of the Court and not as counsel for the Government.

MR. ANDERSON: I see no objection provided the papers that Mr. Christiansen gives do not carry any information which he has a right to keep confidential.

MR. KRESEL: He won't give me any such papers.

THE COURT: He is not to give any of such character.

MR. ANDERSON: Whatever Mr. Christiansen feels that he can give without disclosing work which can be used otherwise or adversely to him or to his prejudice would be entirely agreeable, it seems to me.

THE COURT: I understand from Dr. Christiansen that the work that he has done is not of a kind which would benefit a manufacturer, but he does not want some other chemist to come along and claim the credit in published articles for the work which he has spent many years in working out.

MR. ANDERSON: If the cards or statements on which those experiments which had been published are contained, do not contain information of a technical character or technique which would enable some other chemist to avail himself of them and work out an article which might look like an original discovery, which seems to be his objection, then I see no reason why he should not give those cards; but if they do, I think he is entitled to protection.

I think that Dr. Christiansen made clear he is not concerned with the manufacturing part; it is only the plagiarism.

MR. KRESEL: Suppose we try to do that right away.

MR. CHRISTIANSEN: Certainly.

MR. KRESEL: I think we can get through that in a very few minutes.

THE COURT: While that is being done, suppose you and Dr. Christiansen go in here? (Here Mr. Kresel and Mr. Christiansen went into the other room.)

THE COURT: Now, let the record show this: That Dr. Christiansen has now handed to Mr. Kresel only those cards which contain information already made public. It is therefore unnecessary to impose any restriction upon the person with whom Mr. Kresel confers in connection with those cards. That is correct, is it not, Dr. Christiansen?

MR. CHRISTIANSEN: Yes, sir.

THE COURT: You have given him practically all of them, keeping out only about half a dozen; is that right?

MR. CHRISTIANSEN: I just kept a very few experiments that I could say——

THE COURT: You have given him the vast majority of the cards?

MR. CHRISTIANSEN: Yes, sir.

MR. KRESEL: Yes, sir.

THE COURT: There are no restrictions?

MR. KRESEL: I am entirely satisfied, and I am willing to say that Dr. Christiansen has been frank and open with me about it.

THE COURT: You may confer with any person you please, Mr. Kresel. Thank you very much, Dr. Christiansen.

Now, another matter. The Calco Chemical man—will you come in? (Here Mr. King entered the courtroom.)

Now, with regard to the matter which was just touched upon by Dr. Crossley a moment ago, namely, that Dr. Freedman had acquired certain information from his association with the Calco Chemical Company, was mentioned, and when I went across the hall a minute ago this gentleman here told me he was a director of the Calco Chemical Company and wanted to know what was going on.

MR. KRESEL: What is the gentleman's name?

MR. KING: I am Mr. King.

THE COURT: Will you give that a moment's reflection, Colonel Anderson?

MR. ANDERSON: Dr. Crossley is chief chemist?

MR. KING: Yes, sir.

MR. ANDERSON: I am inclined to think that is sufficient for the Calco Chemical Company, and if it needs anything, and if any information is given in any way, Dr. Crossley can communicate it and it cannot be objected to.

THE COURT: I am inclined to that same view.

MR. KING: May I say a word, your Honor?

THE COURT: Yes.

MR. KING: My reason for asking permission your Honor and gentlemen, is that I am really the only man who is competent to know whether Dr. Freedman is going to employ any of the methods of manufacturing operations which are ours. He was in our employ for a while, and may have learned some of them, and this fact has brought me here.

THE COURT: That is laboratory work.

MR. KING: Quite so, but the methods employed in the factory may also be employed in the laboratory, and they may not be described in the patent. To a person familiar with them, they may not be observed right away, and my real object is to observe just that. I have no other object, because Dr. Crossley is quite as competent as the rest of us.

THE COURT: You mean that Dr. Crossley is not familiar with these particular things?

MR. KING: I am very much more familiar with them than he is. The manufacturing operations are under my directions.

MR. KNIGHT: Are you a chemist?

MR. KING: Yes, sir.

MR. KNIGHT: Will the defendant substitute you for Dr. Crossley? I only make the suggestion.

THE COURT: Mr. Kresel may select whosoever he pleases.

MR. KING: I do not want to replace Dr. Crossley by myself, but I want to observe that feature of it, if I might.

THE COURT: My thought is that we are getting into a collateral thing. We want to protect him, and I am going to protect you as far as I can, but I think as to whether you or Dr. Crossley goes on that, you can confer with Mr. Kresel, and that is his affair and not mine.

MR. KING: I see. Can we decide that later?

THE COURT: You can decide that any time and you do not have to confer with me. Now, Mr. Kresel, your memorandum will authorize the substitution so far as the Marshal is concerned and so far as Dr. Alleman is concerned.

MR. KRESEL: Certainly. If you will wait outside, Mr. King, I will see you.

MR. ANDERSON: Of course, it will be understood that he is to begin from the beginning if there is any substitution.

THE COURT: There is no substitution after the experiment begins. That is right, is it not, Mr. Kresel?

MR. KRESEL: Yes.

THE COURT: Now, the other thing was salvarsan.

MR. ANDERSON: The suggestion was made this morning that we would probably ask for salvarsan to be made by two separate chemists under the patents.

MR. KRESEL: Two separate chemists representing the Government?

MR. ANDERSON: Two separate chemists experi-

menting. One who has been on the stand is Mr. Christiansen, and the other will go on the stand on Monday morning, Dr. Myers of the Public Health Service and now with Mr. Metz.

MR. KRESEL: That is all right; I have no objection. On the contrary, I will welcome it. Now, Dr. Christiansen thought it would take him three days to make an experiment starting with the intermediate already prepared. What suggestion has the Government as to when and how this is to be undertaken?

MR. ANDERSON: I think it will be impossible to finish the experiments before the conclusion of the case. Therefore, my suggestion would be that which the Court embodied in the original suggestion, that the experiments be made here under regulations which the Court would impose, substantially along the lines that we have been discussing the others, and that at the conclusion of those experiments the results be taken in evidence at a time convenient to all concerned at any time before the argument.

MR. KRESEL: My suggestion at this minute would be that your Honor allow this matter to stand over until Monday morning. I should like to think about it. I may have some suggestions to make, with the understanding that your Honor will give us directions about that before we conclude on Monday night.

THE COURT: Very well. It seems to me that in connection with the salvarsan patent I might be helped a little by those experiments, and I was about to say in a particular way. I think I will; and that is this: So far as I can see from the evidence so far in the case, there are only three things to be particularly looked out for in order to pro-

duce probably a useful product, a product that may be used.

Now then, it seems to me that it is a question whether anyone using those three things will produce a useful and safe product. A person not using them might not, and I assume that any person who would make it would use those three steps, and that you would contend that they were necessarily implied from the patent and would be known to a person skilled in the art, while I assume Mr. Kresel's position is the contrary. Consequently, I am wondering whether, while the evidence rests just as it is so far as salvarsan is concerned, an experiment is going to help me, except this: that it might be interesting to have Dr. Christiansen manufacture a safe product from an impure intermediate. Now, that would be instructive for me.

If he takes a pure intermediate, then there are only two steps in addition, so far as the testimony now reveals to me. I will be curious to see whether he puts them in or not, as the testimony now stands, and I suspect, therefore, Colonel Anderson, it would be better to leave this question until Monday morning, so that you can think over just what I have mentioned, and also until after you have had Dr. Myers testify. Do you see any objection?

Mr. Anderson: It is agreeable to me. It was stated this morning, and your Honor suggested that you would consider that question before or after adjournment. I brought it up at this time so that it might be disposed of, if your Honor wished, and in that connection I would not only suggest that we would make salvarsan, but we would have it injected into white rats to be brought here under the same conditions, and test not only

its chemical conditions, but its physiological effects on animals in accordance with the tests of the Public Health Service.

THE COURT: If it can be done, omitting the three steps. You recall the three to which I refer?

MR. ANDERSON: Yes, sir.

THE COURT: If you have anybody who can do that, omitting those three steps, I think that might be interesting; but if he is going to make the experiment following the patent by taking those three steps, which you probably contend are necessarily implied, and Mr. Kresel not implied, then we do not get anywhere from the experiment, do we? It goes right back then as to whether those steps are implied or not and known to one skilled in the art. Do you see what I mean, Mr. Knight?

MR. ANDERSON: I do not for the moment recall them all, because it is very confusing.

MR. KNIGHT: I think, if your Honor please, that those things can best be determined, like all other matters concerning technique, by an actual view of the thing. You get really a better perspective of these things by seeing the thing in operation.

THE COURT: But I do not get a chance to view it.

MR. KRESEL: Mr. Hershkopf makes a suggestion which I rather think well of, and I am going to make to all present here. Why does not your Honor select a chemist of good standing, who has had no connection with this case, who does not know what the testimony is, who has never made salvarsan, and let him try to follow the patent and see where he gets.

Of course, Dr. Myers, if that is his name, who

has been with Metz for three years, or Dr. somebody else who has been with another concern, who has been making salvarsan for three or four years, can today, with the knowledge that they have obtained, and with Dr. Stieglitz's testimony before them, I assume, make salvarsan; but that would bring us nowhere.

Mr. Anderson: If the Court please, there is just the point. The question is whether a person skilled in the art can make salvarsan. Now, this gentleman Mr. Christiansen—I do not speak of Dr. Myers at all—has made salvarsan, according to his testimony, and is prepared to make salvarsan before the Court from following the patents. He is prepared to test it and bring assistants here who tested it under his direction on white rats, and test this salvarsan by the test of the Public Health Service.

If I may suggest, that seems to me to be a pretty good way to find out whether salvarsan can be made under this patent. There are many chemists, chemists who may be the ablest chemists in the world, who are not experienced in this particular instance, just as they might call me on a criminal law case in West Virginia and I could not testify with effect, but if they called me on a corporate law case, I could testify satisfactorily; the same way with chemists. It is a specialized business. A man is supposed to be skilled in the art of doing this and that particular branch of chemistry.

The Court: I am going to let you make the experiment, that is, the demonstration, if you want to.

Mr. Anderson: I shall be glad to think it over until Monday.

The Court: I only mention these other things

but is not this the position: I have been in the habit of putting all my cards on the table all the way through, so far as I have reached any conclusion, but I have a notion of this kind, Colonel Anderson, that I think it may be reflected in the Coca-Cola case, that to take a transaction you pretty nearly always have got to take the setting as of them; that is, you take a contract or you take a statute, for instance, take the Civil War statute, and if you do not put in Civil War history, but, leaving out that history, try to see what that means, I doubt if you can.

Suppose you take the transaction with respect to the salvarsan patent. It seems to me that the testimony you offered this morning of Dr. Gibbs, if his recollection is substantial, may furnish a part of the setting. It does not furnish all the setting. The testimony which you read from Dr. McCoy's testimony before the Winslow Committee is a part of the setting, showing the facts and the circumstances and the atmosphere under which this took place.

The point of all this talk is that while I am glad to have, so far as I am concerned at the moment, half a dozen chemists say they can make salvarsan according to that patent, yet I am wondering whether the sum total of such testimony will weigh much unless it be shown that it was so recognized, generally speaking, at the time of the sale.

It seems to me to be going a step further. I mention Dr. Gibb's testimony as it seems to me of some importance as to what he said to Mr. Garvan, and it seems to me there is testimony equally as important if not more important in Dr. McCoy's testimony before the Winslow Committee,

that there was a general understanding throughout the country that it would not work.

MR. ANDERSON: I do not think Dr. McCoy said that.

MR. KRESEL: Yes, he did.

THE COURT: I do not mean to state it as strongly as I probably did; but as having that tendency rather than stating it absolutely. If we receive the testimony of these chemists and they say that it will work, and they demonstrate it, I would not be surprised if we could get a number of chemists now who could demonstrate it. You know, it is common in patent law that after a thing is done, Mr. Knight, there are plenty of people who can do it after somebody else has and told them how. I think the general impression in the art at the time of the transaction is also of some help to me. I do not know whether it would be to any other court, but it is to me.

MR. KNIGHT: It seems to me, your Honor, that a good part of the consideration here has been as to what might be called, if we come to see these experiments in process, or the reports of them, that they may involve differences in chemical technique. Now, one chemist will follow one technique and another another technique, and it seems important to see whether one has employed an especially favorable technique. Another one may have a different technique and may have quite a different slant on the things which a chemist will naturally, according to his own idiosyncracies, follow. But if I remember rightly, Dr. Myers talked about what he had done while he was with the Public Health Service, and he made a certain series of tests and manufactures in a laboratory of this drug, and if he should dupli-

cate it, if that is what this calls for—I am not quite sure; I have not worked that out—if he should really duplicate what he did with the technique he then used, then it will appear from the reports of such experts as your Honor assigns to it, what was done and whether Christiansen or Myers did anything unusual at that time; whether, in other words, there is such a departure from the bare bones of the patent as to call for special comment.

THE COURT: Yes, but then you get into this difficulty Mr. Knight: If the manufacturers of the country were attempting to produce a product and the Public Health Service—I am only giving you the thoughts that occur to me at the moment—and the Public Health Service found it necessary to put the standard down at a certain time, say, to sixty milligrams——

MR. KNIGHT: Fifty is the lowest.

MR. KRESEL: As low as fifty.

THE COURT: That in itself possibly carries some weight. So I am not just sure. I would like to have your view.

MR. KNIGHT: Those exact facts may also come out, and as a result of these experiments, it may lead to something of that kind.

THE COURT: I am glad to have the experiments.

MR. KNIGHT: You would get light from them, your Honor. I do not know how they will come out. A man always goes into these experiments with fear and trembling, because anything may happen; but the Government would like to demonstrate.

THE COURT: I think the Government has the right. The defendant says it can not be done and it is easy to make a failure.

MR. KNIGHT: We want to have the opportunity to do it.

THE COURT: You may have it. I will arrange the time on Monday at the close of the testimony.

MR. ANDERSON: Very good, sir. Any time at your Honor's disposal.

MR. KRESEL: The curious feature to my mind is the United States Government and its Public Health Service and its laboratory found that salvarsan could be made so easily that the country was permitted to starve for salvarsan, and the United States Public Health Service went around and testified before the committee that nobody knew how to do it.

(Whereupon, at 3:00 o'clock P. M. standard time, adjournment was taken until Monday, July 23, 1923, at 8:00 o'clock A. M. standard time.)

(Continuation of session July 23, 1923.

MR. ANDERSON: I would state to the Court that last Friday or Saturday, counsel for the defendant requested Dr. McCoy to bring here certain data. He was under cross-examination at that time. Dr. McCoy is in Court and I would like to get as many cross-examinations out of the way as I could, before I take up other witnesses. In the second place, I will state that Dr. Gibbs is under cross-examination, but he is otherwise engaged under your Honor's orders. I would like to ask in that connection what time your Honor is going to take a recess for luncheon today. Of course, I understand we are going to sit right through.

THE COURT: Can we shorten the noon recess to an hour?

MR. ANDERSON: I will be very glad to.

THE COURT: We will take a noon recess in half an hour, at 12 o'clock standard time.

MR. KRESEL: As far as Dr. McCoy is concerned I have no desire to further cross-examine him. If he has any documents, I would be glad to look at them. I will do that in a little while. I do not want to do it now.

PAUL A. BLAIR.

PAUL A. BLAIR, was called as a witness on behalf of the plaintiff, in rebuttal, and being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. ANDERSON:

Q. 1. Mr. Blair, state your full name and place of residence.

A. Paul A. Blair; residence, Washington, D. C.

Q. 2. What is your profession?

A. Patent Attorney and more especially representing the Bureau of Ordnance, Navy Department.

Q. 3. You are connected with the Navy Department?

A. To the above extent.

Q. 4. Are you a brother of Mr. Blair of the firm of Emery, Varney, Blair & Hoguet of New York?

A. I am his brother, but he is no longer connected with that firm.

Q. 5. Was he connected with it in 1919?

A. He was.

Q. 6. In 1920?

A. Yes.

Q. 7. There has been introduced in evidence here a letter dated January 23, 1920, from you to the Chief of the Bureau of Ordnance and it was intro-

duced by the defendant as Defendant's Exhibit 86 I think. The instrument is called a Release and License from the Chemical Foundation to the Navy Department, which appears to have been executed on the 17th day of November, 1921, with a statement of acceptance thereon by Theodore Roosevelt, Acting Secretary of the Navy, December 1921. Can you state if you had anything to do with the negotiations in connection with that license and with whom?

MR. KRESEL: To that I object on the ground that it is immaterial and irrelevant. If there were any negotiations they are merged in the final instrument. The testimony is therefore incompetent.

THE COURT: I will hear you, Colonel Anderson.

MR. ANDERSON: There may be some ground for the objection. I was hoping that it would not be made because of the fact that I had arranged and expected to bring the evidence in, as counsel understands, by another witness entirely who has not been called. I will not go into the circumstances. I think that in the circumstances of this case, the conditions under which this license——

THE COURT: Are they pleaded in the Bill?

MR. ANDERSON: No, sir. The license is not pleaded at all in the Bill. It is a matter brought out absolutely on defense. There is no reference to it in the Bill. It is a matter of defense pure and simple. Therefore, I think the conditions surrounding the granting of the license and the negotiations connected therewith are relevant under the peculiar facts of this case. I think that is all I have to say about it.

MR. KRESEL: I do not know what peculiar facts counsel is referring to. Here is an instru-

ment made between the two parties to this suit. It sets forth the conditions. They can not be varied by any external testimony and therefore this witness can not be permitted to testify as to what the negotiations were.

THE COURT: I do not know of any ground on which I could accept his answer. It seems to me the objection is well taken. If you have any authority on which you stand in asking this question, I will be glad to see it and will be glad to have you refer to it. I do not think of any at the moment.

MR. ANDERSON: My purpose in asking the question is to prove by this witness that the negotiations——

MR. KRESEL: If your Honor please, I do not think it is proper for counsel to put it on the record.

MR. ANDERSON: I think I have a right to state my purpose under Rule 46, your Honor having sustained the objection, to the end that your Honor may better understand my purpose.

THE COURT: I will hear the purpose and then I will hear you, Mr. Kresel.

MR. ANDERSON: My purpose is to show that the negotiations granting to the Government this license were taken up as between the Chemical Foundation and the Government with or by and at the office of Mr. Hoguet, New York. Whether that circumstance, taken in connection with other circumstances, would have any bearing in this case, I do not now desire to argue because the evidence is voluminous and I have not had a chance since Saturday to go over more than the evidence taken on Saturday. It seems to me under the facts and circumstances of this case which

need not be recited, and with which your Honor is familiar, that that evidence is material. I have stated to your Honor as frankly as I can that I recognize under ordinary conditions the rule invoked by counsel applies, but I think the conditions here are such as to take it out of the rule. Your Honor is as familiar with those conditions as I am.

THE COURT: I still do not see the relevancy of that fact. The objection is sustained.

MR. ANDERSON: Your Honor will allow me an exception?

THE COURT: Yes. Furthermore, I think it is not proper rebuttal. It is neither relevant nor in rebuttal, as I understand it, Colonel Anderson.

MR. ANDERSON: If your Honor will permit me, we certainly did not have anything on direct on the question of licenses, because it was introduced in the defense.

THE COURT: If it has any bearing in any way whatsoever, it must be an element in the charge of conspiracy; and you can not split your evidence with respect to the conspiracy. So that if this is a point in the conspiracy, it ought to have been put in in chief and not in rebuttal. It is not in answer to anything that has been brought out as far as I know.

MR. ANDERSON: May I suggest, sir, that I suppose the license in question is pleaded as an estoppel by the United States, which is an affirmative defense, and therefore a matter which we ought to have the right, I think, to reply to?

THE COURT: Do you contend that that would invalidate the license?

MR. ANDERSON: No, sir, I am not concerned with that at all. I do not think as a matter of

law it can be revoked. But I think, as long as it is invoked here as an estoppel, the circumstances surrounding it should be shown.

THE COURT: Do you contend that this evidence which you now offer would tend to show that the license is invalid or void?

MR. ANDERSON: I would not say that that would show that the license is invalid and void, but I would say that there are circumstances surrounding it that might make it invalid or void. The only reason, I take it, that the license has been introduced in evidence, this great voluminous paper, is to claim that the United States Government is estopped in the question of this sale. This paper was produced for the first time on defense, and if we can not reply now, we would never have a right to say anything about it at all.

THE COURT: I ask you what is the legal purpose and your contention as to the legal effect of the evidence which you offer.

MR. ANDERSON: To show that under the circumstances of this case, even if there could be an estoppel upon the Government of the United States, that this paper would not operate to estop it.

THE COURT: I do not know why yet. It may be fraud, accident, mistake, or something else. I have not my attention directed to the particular matter unless you point it out to me; and that is what I am asking you to do.

MR. ANDERSON: My view is this, that if this instrument which is introduced in evidence is introduced as an estoppel, and it appears in connection with other evidence in the case that it was negotiated and given to the United States of America under circumstances which indicated

a desire to use it as an estoppel, it would very seriously affect its value for that purpose, assuming that in law it could operate as an estoppel.

THE COURT: I am afraid I cannot get it very clearly, so I will stand by the ruling and the objection is sustained. Your exception was noted.

Q. 8. Mr. Blair, do you know Mr. A. M. Holcomb, Major Holcomb, so-called?

A. I have known Mr. Holcomb for approximately six years.

Q. 9. Did you know him during the war?

A. I met him very early during the war.

Q. 10. He was connected with the War Department, Patent Division, during the war, was he not?

A. He was.

Q. 11. Do you know where he has been since he left the Army?

A. He has been the Washington representative of the firm of Emery, Booth, Janney & Varney of Boston.

Q. 12. Was he formerly before the dissolution of the firm of Emery, Varney Blair & Hoguet, a representative of that concern?

A. He also represented the New York office which is the same.

Q. 13. Which is the same thing?

A. Substantially, yes.

THE COURT: The New York office of what?

MR. ANDERSON: The New York office of Emery, Varney, Blair & Hoguet.

Q. 14. Which is the organization or office of which Mr. Ramsey Hoguet was a member, is it not?

A. Yes. I might explain that there is the main office in Boston and a separate office in New York; a third office in Chicago and a fourth in Washington. Mr. Holcomb has charge of the Washington office.

Q. 15. Do you know about what time he took charge of the Washington office?

A. I should say some time during 1919, I believe.

Q. 16. Do you know Howard W. Dix?

A. I met Mr. Dix I should say about 1915, in the Patent Office.

Q. 17. He was also an officer of the Army, Ordnance Department, Patent Division, during the war, was he not?

A. He was.

THE COURT: This is in rebuttal of what, Colonel Anderson? I can not quite follow you and I will have to get you to tell me.

MR. ANDERSON: If your Honor please, I do not know directly that it is in rebuttal of anything except the conclusions which may be drawn from the general evidence—no specific statement I will say, however, that I had intended to put Mr. Hoguet on the stand on the affirmative case, to prove these facts on the record. Mr. Kresel stated to me, I think, in Court, that it was his purpose to put on Mr. Palmer, Mr. Garvan, Mr. Choate and Mr. Hoguet. Conditions arose subsequently which he explained to me, to my entire satisfaction, so that he could not put on Mr. Hoguet. Therefore, it became necessary to agree on those facts or I would be put in the position——

THE COURT: I knew nothing about that arrangement.

MR. ANDERSON: Of course, you knew nothing about that. I did not want to mention it, because it is one of those arrangements between counsel that I did not want to mention at all.

THE COURT: I do not understand how this is rebuttal. But if there is no objection, under the circumstances, it may be taken.

MR. ANDERSON: I merely wanted to ask Mr. Blair those connections.

Q. 18. Do you know where Mr. Dix is now?

A. Not positively, but I think he has a separate office in the Woolworth Building.

Q. 19. Where did he go when he left the War Department?

A. He returned to Emery, Booth, Janney & Varney in New York.

Q. 20. And that was the firm with which Mr. Hoguet was then connected?

A. Yes.

Q. 21. That was in 1921?

A. Approximately that date, I believe.

MR. ANDERSON: In the circumstances, sir. the objection having been sustained on this other point, I have no further questions to ask Mr. Blair.

MR. KRESEL: That is all, Mr. Blair.

MR. ANDERSON: I wish to state to the Court that a few days ago, counsel for the defendant called on the Government to produce the original report of Colonel Joyes—I have forgotten his name—and the original report of Major Sill, supposed to be on file in the War Department. The request was communicated to the office of the Attorney General, with the request that he ask the Secretary of War to have the papers produced. I am advised by him that the Acting Secretary of War, the Assistant Secretary, Mr. Davis, declines to produce the papers, deeming it in the public interest, unless by an express order of the Court; the circumstances being such that he feels it is not in the public interest.

I may state that a similiar letter was received from the Secretary of State as to certain

papers requested, which I think was communicated at the time; and so far as I know, all other papers asked for of the Government have been produced.

There was one other request of counsel for a copy of the report of Mr. Palmer to the President in 1918, a letter to him in regard to procedure, I think, with regard to alien property. The request was communicated to the White House and we are advised that a careful search has been made for the report and the same can not be found. There is no record of it that they can find. I would be very glad to produce that letter here. It came in this morning but I forgot to bring it over.

I am making this statement at this time because I have these matters in my notes here and I want to see if I have responded to all the requests counsel have made.

THE COURT: Do you press for an order with respect to Major Sill's report, Mr. Kresel?

MR. KRESEL: No, your Honor. Under the circumstances, if the Government feels that it is against public interest to produce those, I shall not press it.

THE COURT: That applies to the papers in the office of the Secretary of State as well?

MR. KRESEL: Yes.

MR. ANDERSON: I regret myself that it can not be done, sir, but I have done my best. I think in regard to the formal request at the Bar for cablegrams between Mr. Bradley Palmer and Mr. A. Mitchell Palmer and Mr. Garvan we have complied with that request. Is that not true, Mr. Kresel, so far as you know?

MR. KRESEL: Some such papers have been

handed to us. I have one that I am going to ask to put in evidence before we close.

MR. ANDERSON: I will state to your Honor that I think it was in connection with some of those papers being transmitted between the Peace Conference and Washington that the Secretary of State wrote a personal letter to the Attorney-General, stating that he could not produce them. But all that they did produce we had brought up here by a representative of the State Department and copies of the originals made here and turned over to counsel. That is the best we can do under the circumstances.

THE COURT: I wonder whether you could not inspect those documents and, if they have any bearing upon any of the issues of this case or any evidence that the Government has presented, you could not make use of them without disclosing their contents. I will leave that entirely with you, Colonel Anderson.

MR. ANDERSON: I shall be very glad, sir, at my earliest opportunity to look at those papers as far as they will permit me to see them, and report to the Court whether I feel an order should be entered to produce them, if they have any bearing.

THE COURT: No, I do not want them produced; but I do not think the Government of the United States in presenting its suit here, or any of the Executive Departments, should conceal from you information disclosed by those documents. I shall be perfectly satisfied with anything that you do with respect to this case, or any of the evidence in this case, after you have inspected them; but if they are supposed to be

relevant and material I think you ought to inspect them. If necessary I will make an order to that effect.

MR. ANDERSON: Insofar as the War Department is concerned, as I understand the law your Honor's order would apply. I do not know how far the records of the State Department even could be shown to me, because the President sometimes refuses to transmit them to the Senate even for Executive session, as your Honor knows. That question has been up in the past. I do not know the law on that subject, but whatever order your Honor makes I should do my best to comply with, that is all.

THE COURT: No, I will begin and stop here—that I think and am of the opinion that there should not be withheld from you in prosecuting this suit in behalf of the Government of the United States any documents or information which would be relevant or material to the issues of this cause. I do not go further than that because I feel confident that should there result from such disclosure a conviction on your part that your position should be modified in any particular, you will not hesitate so to modify it.

MR. ANDERSON: Not in the slightest.

THE COURT: Consequently, I stand ready at any moment that I find any information is withheld from you by any Governmental department to make such order as will aid you in getting that information, or to make such disposition with respect to this suit as will enable you to know whether you want to stand on the evidence now in.

MR. ANDERSON: The only information that has been directly withheld from me, sir, is the infor-

mation which I have stated that the State Department and War Department have declined to produce in Court. Whether they would let me see it I do not know, but I think probably they would. The only other information is that of the Tariff Commission, which I asked for. One of the Commissioners came to Wilmington and explained to me that under the law as they understood it they could not even give it to me. I said that being true, I must get along without it. I do not think it was statistics in regard to dyestuffs and I do not know that it is so valuable that I could not conduct the case without it, although I was very anxious to get it. I declined to press the matter further because I felt if they held that view I would not use it.

THE COURT: You see, you agreed to present here after the first of August those official publications.

MR. ANDERSON: The official publications do not give all the information I wanted, sir, and the other was confidential.

THE COURT: Well, I hope you will try to see those documents.

MR. ANDERSON: I will do my best, if your Honor please. I would ask leave, if your Honor please, to clean up a few things before adjournment, because there is no use putting a witness on the stand and qualifying him and then taking a recess.

I would ask leave, if your Honor please, in connection with the statement from the testimony of Mr. George J. Roberts read by counsel for the defendant in the closing days of their case from the hearings on H. R. 10329 and Senate 3390 before the Committee on Military Affairs of the

House of Representatives in April, 1920, from page 95 of those hearings, to read a sentence in addition to what counsel read. Counsel read a statement which I will not re-read, as to the negotiations between Mr. Roberts and certain private interests, to take over Nitrate Plant No. 1 To that I now refer. The closing part of the paragraph is as follows:

"An effort was also made to get certain financiers in New York to undertake to form a company to operate these plants. Scant consideration was given to the claim and no investigation undertaken. An appeal was likewise made to the coke oven interests with the same result." There counsel stopped. The additional sentence appears in the same paragraph, as follows:

"There seems to be a decided antipathy of capital to engage in any partnership arrangement with the Government."

That is explanatory.

The remaining documents which I wish to introduce here, which are merely supplemental to what was put in by counsel for the defence, will require some little time, and in the order of the record I should very much prefer to put them in at the conclusion of the case. I am confident, unless something unusual happens, that the case can be concluded at some reasonable hour either this afternoon or this evening. Therefore, as it is now twelve o'clock, I should like an adjournment at this point instead of going into something else.

Mr. Kresel: May I inquire how many more witnesses the Government will call?

Mr. Anderson: Possibly two or three. It depends upon whether some of them can get here in time to be called today. We are trying to get them. If we cannot, why we will stop and close

as best we can; and the other points that we discussed on last Saturday I will ask leave to take up later. At the present time, if it is convenient to the Court, I would like to take an adjournment to the end that I may not break in on some other line of questioning.

MR. KRESEL: I understand that they are ready to report on that other matter. Does your Honor want to take it up now?

THE COURT: Report on what?

MR. KRESEL: On this experiment.

THE COURT: We will take that up after recess. Recess for one hour.

(Recess.)

AFTER RECESS.

MR. ANDERSON: Is it now your Honor's pleasure to take up the experiment made under your Honor's direction?

THE COURT: Yes. Let Dr. Freedman take the stand.

MR. ANDERSON: Before he takes the stand, if your Honor please, I would like to ask leave to substitute the reprint of the article by Dr. Christiansen, for the copy offered from the books this morning.

THE COURT: Let the substitution be made.

LOUIS FREEDMAN, resumed the stand.

RE-DIRECT EXAMINATION.

By MR. ANDERSON:

RDQ. 191. Dr. Freedman, on Saturday the Court directed that you should, in the presence of chemists representing either side and one appointed by the Court, undertake to make cinchophen under the pat-

ent, which you have seen, and to which you referred in your testimony. Have you carried out the Court's instructions in that regard?

A. I have.

RDQ. 192. Please state where the experiment took place?

A. The experiments took place at the Hall of Chemistry of Swarthmore College, Swarthmore, Pennsylvania.

RDQ. 193. Please state when you began your work?

A. I began my work Saturday night at approximately ten o'clock. It continued till about midnight, and the work consisted in preparing some of the laboratory equipment, getting ready for the actual experiment. The actual experiment started at seven o'clock Sunday morning and continued until 5.30 this morning.

RDQ. 194. Monday morning?

A. This morning, Monday morning, and then tests were made on the products from eight this morning until 11.30.

RDQ. 195. The record shows that the Government nominated Dr. H. D. Gibbs, who has testified in this case, as a chemist to observe your work in behalf of the Government; that the defendant nominated Dr. Bolton and Dr. Crossley, both of whom have testified in this case, to observe on behalf of the defendant; and the Court appointed Dr. Alleman, of Swarthmore College; and it was required that the experiment should be conducted under the supervision of the United States Marshal or his Deputy. Were these gentlemen present during the period of your experimental work all the time?

A. The gentlemen you have enumerated were all present.

RDQ. 196. At all times during the work?

A. Yes, sir.

RDQ. 197. Did you obtain anywhere, from New York or elsewhere, as you indicated a desire to do, the ingredients or intermediates to use in making this cinchophen?

A. I did, I obtained them from New York City.

RDQ. 198. By special messenger?

A. By special messenger; yes, sir.

RDQ. 199. The Court directed that you should make one of the ingredients or intermediates, which has been called here pyruvic acid, if I recall correctly. Did you undertake to manufacture that ingredient in the laboratory?

A. I undertook to manufacture it; yes, sir.

RDQ. 200. The Court then directed that you should make, following the process outlined in the patent, as to which you testified, cinchophen under the direction of these gentlemen. Did you undertake to do that?

A. I did undertake to do that.

RDQ. 201. I will ask you if the laboratory material furnished by Swarthmore College, I mean equipment now, under the direction of Dr. Alleman, was suitable for your work?

A. They were as suitable as I could expect under the circumstances.

THE COURT: You were satisfied with them before you began your experiment?

THE WITNESS: Yes, sir; excepting, your Honor, the capacity of the iron still. It was a little small, but as I could find no other to do the work, I undertook to carry out the experiment in that still on a smaller scale.

RDQ. 202. Doctor Alleman, who was in charge of the laboratory, extended to you every courtesy and facility that he had, did he?

A. Dr. Alleman did yeoman service in extending to me every facility that he could.

RDQ. 203. Did you work steadily at this experiment from Sunday morning—at what hour did you say?

A. At seven o'clock, approximately.

RDQ. 204. Until five o'clock the next morning?

A. 5.30. Yes, sir, the time taken out for eating.

RDQ. 205. Did you sleep any in the meantime?

A. No, sir.

RDQ. 206. I believe you said that you are to be married on Tuesday night?

A. Yes, sir.

RDQ. 207. You facilitated this work in every way that you could, did you?

A. I did; yes, sir.

RDQ. 208. Now, I will ask you to state what you did and what was the result? If you have any notes of your work before you, you can refer to them.

A. The first experiment in the preparation of cinchophen I started at 8:15 A. M. Sunday morning. I added the ingredients as directed in the patent and carried out the reaction as directed in the patent, according to the time and the proper means given in the specifications of the patent.

I started the second experiment for the preparation of cinchophen shortly after the first was started, while the first was still in operation. In the first reaction I used chemicals which were sent to me from New York, my own. I used the—

MR. ANDERSON: One moment, if your Honor please, this witness has had no sleep since the little sleep he had Saturday night. I would ask, therefore, that every consideration be shown in testifying, as I know your Honor would be only too glad to do, that he may go slow. He is under very great strain, of course.

THE COURT: He may.

RDQ. 209. Now go ahead, Doctor, speak slowly, and take it easily under the direction of the Court.

A. In carrying out the first reaction, I used the re-agents that were sent to me from New York, including pyruvic acid, which I found to be desirable and of good quality. In the first reaction, the quantities carried out were exactly what is given in the patent. In the second experiment, the quantities were exactly as given in the patent, but they were proportionately cut in half.

RDQ. 210. Proportionately what?

A. Cut in half, which under the patent, I had the right to do. In the second experiment, at the suggestion of Dr. Alleman, and in agreement with the other observers, I used his re-agents—his re-agents.

RDQ. 211. Name them, please.

A. Benzaldehyde, aniline oil.

RDQ. 212. Yes.

A. And cologne spirits.

RDQ. 213. Go ahead.

A. On the question of pyruvic acid, which was a second sample also sent to me from New York, but which was not of the same quality as the first, and which I used without rectifying, as it was inexpedient for me to rectify that intermediate, due to the fact that time was lacking and it would have necessitated the stopping of the manufacture of pyruvic acid by changing pumps, and I would not have had time to manufacture pyruvic acid if I had taken the time to rectify that substance; I therefore went ahead and used it as it was.

RDQ. 214. Yes. Now follow through the steps which you undertook, and first, you might take up pyruvic acid, and follow the steps which you followed and tell us what you got.

A. Yes, sir, in the first reaction—

RDQ. 215. You are speaking of pyruvic acid?

A. Yes. Pardon me, did you say the manufacture of pyruvic acid?

RDQ 216. No. I am speaking now of your manufacture of pyruvic acid; suppose you take that first and say what you did get.

A. Well, I am not yet through with cinchophen.

RDQ. 217. Go ahead and finish your way.

A. The first reaction was completed entirely at 1:40 P. M.

RDQ. 218. On Sunday?

A. On Sunday, yes, sir. The crude product obtained was isolated and experiments were immediately started by me for purification of this product by the methods known to me.

RDQ. 219. Were they methods known generally?

A. Methods known generally and methods which I obtained in my chemical experience. This purification method was not disclosed in the patent.

THE COURT: What does the patent say on that point?

THE WITNESS: It says the product is then purified in the known manner.

RDQ. 220. Very good. Go ahead. What result did you get as the result of the first?

A. As the result of that reaction I obtained a crude product which gave me a net weight of 1.84 grams.

RDQ. 221. What purified product did you get?

A. The purified product which I obtained was a product which, from my experience I recognized as cinchophen.

RDQ. 222. What yield did you get?

A. The yield was 67 grams. This product had a melting point of 210-1-2 degrees to 211 degrees Centigrade. It darkened slightly at 197 to 200 degrees Centigrade and softened at 205 to 206 degrees Centigrade.

In testing with ammonia, it gave a slight opalescence. This compound at the present time, I will say, is not a first grade marketable product; but if time had permitted me and my physical condition had enabled me, I could easily have made this a highly marketable product within one hour's time, with the loss of four to five grams at the most.

RDQ. 223. Could you have done that by known methods?

A. By known methods; yes, sir.

RDQ. 224. Have you completed your statement as to the first experiment?

A. No, sir; not yet.

RDQ. 225. All right. Finish it.

A. I also took one of the alcohol mother liquors from the first experiment and obtained by suitable means from that mother liquor 15 grams of crude material, to prove my contention that the mother liquors contain additional cinchophen which can be obtained by suitable means after the product is purified; that is, after the main product is purified.

RDQ. 226. When you speak of suitable means, are those means known to those skilled in the art?

A. They are, to those experienced in that work.

RDQ. 227. Have you finished yet?

A. Yes, I have.

RDQ. 228. That is your first reaction?

A. That is my first reaction.

RDQ. 229. What was the product that you obtained as a result of that experiment under the patent?

A. The product which I obtained in the experiment under the patent was cinchophen.

RDQ. 230. You spoke of the second experiment with the mother liquor. Did you in fact obtain cinchophen from his experiment with the mother liquor, in addition to that which had resulted from the original crystallization or operation?

A. I did not test this product, but I know it from my experience to be a crude cinchophen.

RDQ. 231. I neglected to ask you, Doctor; have you made any cinchophen yourself since 1918?

A. Since 1918, I have made no cinchophen.

RDQ. 232. You did not have with you any of your laboratory notes, anything of that kind, did you?

A. Except in the manufacture of pyruvic acid.

RDQ. 233. Before we come to pyruvic acid, I will ask you to take the second experiment, which you said you did with a pyruvic acid which was produced in New York, which was not of the same grade as that used in the first experiment, and explain to the Court exactly what the circumstances were, follow through the details and give the result.

A. In the second experiment, which was started at 8:45 A. M.—

RDQ. 234. Sunday morning?

A. On Sunday morning, I used the same parts by weight as given in the patent, but I took half of the proportional amount of each ingredient named, as the patent stated the parts by weight. I carried out the reaction according to the patent substantially as the first reaction was carried out. The reaction was completed at 1.54 P. M., Sunday. This reaction gave me a darker crude product and material which from appearances did not look so fine as the first crude product.

RDQ. 235. Are you prepared to say to what that is to be attributed?

A. I believe that is attributable to the pyruvic acid.

RDQ. 236. Proceed. Did you test that product and crystallize it, or what was necessary to bring the result?

A. No, that product was purified first.

RDQ. 237. By the same method employed in the other case?

A. By substantially the same method as given in the first. There may have been little variations of time when each step was done, but substantially the method was the same.

RDQ. 238. And what did you get?

A. I obtained cinchophen.

RDQ. 239. As to the grade, have you anything to say. I believe you said it was not as good a product as that obtained in the first experiment?

A. The crude product was 79 grams net, and on final purification the yield was 17.8 grams. The compound melted at 211 to 212 degrees centigrade fairly shortly. On testing with ammonia, it gave no opalescence, showing that the product is a good, marketable product.

RDQ. 240. What would you call the product which was produced?

A. Cinchophen.

RDQ. 241. Did you have any trouble in either of those experiments with any of the apparatus used, or any accidents of any kind?

A. No, sir, not in those experiments.

RDQ. 242. Is that all you have to say or can think of in giving the Court the facts as to the first and second experiments for making cinchophen, beginning with the pyruvic acid?

A. I just wish to modify that, in the second experiment I was working with smaller quantities, and in the purification when working with small quantities the loss was considerably greater proportionately than when working with larger quantities; and consequently, my yield was cut down considerably. But the substance cinchophen can still be obtained from the mother liquors, as I have shown from Experiment 1. Those mother liquors have all been placed in the custody of the Marshal, and they are at the liberty of the Court.

RDQ. 243. In the event that the Court so desires, could you return here say in two weeks and complete the analysis of those?

A. I can, yes, sir.

RDQ. 244. The Court allowed in its order that you should make three experiments. You only made two?

A. I only made two, yes, sir.

RDQ. 245. Why did you not make the third?

A. I did not make the third because time did not allow me to. I was running three experiments, two on cinchophen and one on pyruvic acid, and I am only human; I cannot tear myself apart. I was on my feet all day, running from one bench to the other, and it was not humanly possible for me to take care of more than the work I did.

RDQ. 246. Did you suffer from physical or mental weariness during the conduct of these experiments?

A. Well, I suffered temporarily. I do not expect any permanent injury. I was very weary as you might expect.

RDQ. 247. Now, Doctor, take up the pyruvic acid and state what you did in the production of that acid.

THE COURT: Let me inquire as to when these experiments began.

By THE COURT:

Q. 248. They began at 7 and 8:45, and ended when?

A. The actual experiments began at 8:15, the first, and ended at 1:40 P. M.—that is, the reaction itself. The purification was done as I could find time in the interim.

By MR. ANDERSON:

RDQ. 249. But you were working steadily from 7 until 5 this morning, were you?

A. Absolutely, yes, sir, until 5:30 this morning.

RDQ. 250. If you have nothing further to add, and the Court desires no further questions about that, I would be glad if you would tell the Court just what you did in the matter of making the pyruvic acid which the Court directed you also to make.

A. The equipment which I had at my disposal under the kindness of Dr. Alleman was a vacuum pump, which on testing on the line gave me 25 or 26 inches of vacuum, which was suitable for that first part of the experiment—I do not know how it would have worked for the other because I did not try it—and an iron retort of approximately two liters capacity. The ingredients which I used were 180 grams of potassium bitartrate and 345 grams of potassium bisulphate. They were mixed in a uniform mixture and deposited in the retort, the retort sealed, and the retort heated in a methyl bath which was prepared for me by Dr. Alleman with the aid of some of the other observers. The methyl bath was heated on a free flame and the distillation was begun, starting suction. A short time after the beginning of the reaction, or the distillation, rather, the pump stopped due to the breaking of the belt. Some little difficulty was necessary in fixing it. The reaction was again started at 5:58.

RDQ. 251. When did you start first?

A. 5:25 P. M.

RDQ. 252. 5:25 P. M.?

A. Sunday.

RDQ. 253. All right, go ahead.

A. Shortly after reaction started some of the material foamed over and plugged the line, which necessitated my waiting until the retort cooled sufficiently so that I could remove the glass tube and supply a new one. The reaction was again started and was finished without difficulty about midnight—approximately seven hours.

RDQ. 254. What did you then do?

A. I beg your pardon?

RDQ. 255. What did you then do, at the time of finishing the reaction or distillation?

A. Directly then?

RDQ. 256. Yes. I mean did you do anything further with the pyruvic acid?

A. That product which I obtained was crude pyruvic acid, and I did not do anything further with it.

RDQ. 257. You did not use that in your process of making cinchophen?

A. No, sir. In order to utilize that substance for making cinchophen it must be rectified.

RDQ. 258. I believe you said you did not have the time to rectify it?

A. That is correct.

RDQ. 259. Has that substance been turned over to the Marshal?

A. All in the hands of the Marshal.

RDQ. 260. Would it be practicable at a later day for you to return and rectify it?

A. Yes, sir.

RDQ. 261. Under the direction of the Court you would be willing to do that, of course?

A. Yes, sir.

RDQ. 262. You did, then, as a result of the operation which you have described make pyruvic acid in its crude form, which for use in the making of the drug cinchophen would require further rectification, is that true?

A. That is correct.

RDQ. 263. You said that you were busy up to 7 o'clock this morning. What did you do from midnight till 7 o'clock?

A. From midnight till 7 o'clock I was busy in the purification of the cinchophen.

RDQ. 264. Did you work any after 7 o'clock?

A. I beg your pardon, did you say until 7 o'clock? Not until seven.

RDQ. 265. Did you have to do anything more after that?

A. From about 8:30 on, the substance was tested and I was kept busy in drying the purified materials and supplying them to Professor Alleman for proper testing.

RDQ. 266. What time did you complete the entire operation?

A. I think it was about 10:30 to eleven o'clock, between.

RDQ. 267. Today?

A. Today, yes, sir.

RDQ. 268. Were you working steadily from seven o'clock yesterday morning until 10:30 or 11 today?

A. With the exception of about half an hour when I went back to the Strathmore Inn in Swarthmore—I believe that is the name—and I laid down for about half an hour but did not sleep. Subsequently I arose and started to make out my report.

RDQ. 269. Would you care to file your report with the Court in this case, or would you rather keep it —just as the Court may require.

A. My report, exclusive of the notes was—I started but I did not finish it—I started it as a statement to the Court.

RDQ. 270. Yes. Would you prefer to take that, and finish your statement or report?

A. Yes, sir, I would.

MR. ANDERSON: And file it later. Would your Honor be willing to have that?

THE COURT: Yes. I am not concerned with his report. I am only concerned with his testimony.

MR. ANDERSON: I do not know whether your Honor wanted the report or not.

THE COURT: No. You need not trouble about the report.

MR. ANDERSON: Is there any other question the Court wishes me to ask? I do not recall any.

THE COURT: I will see whether there is any cross-examination, and at the close of that, if there is anything to ask, I will.

MR. KRESEL: I think, sir, it might be advisable to reserve any cross-examination until your Honor has heard the testimony of the observers. I assume that your Honor desires to do that.

THE COURT: That will be satisfactory.

MR. ANDERSON: I have no objection in the world.

THE COURT: All right.

MR. ANDERSON: I would like to get Dr. Freedman away this afternoon if we could.

THE COURT: Very glad to hasten the matter for him as much as we possibly can.

MR. ANDERSON: Because he is very anxious to get home, of course. Then, you can stand aside for the moment, Dr. Freedman, and would your Honor permit me to call Dr. Alleman first, or Dr. Gibbs?

THE COURT: I think Dr. Alleman should be called last.

MR. ANDERSON: Last. Yes, sir. Then I will call Dr. Gibbs.

HARRY D. GIBBS, resumed the stand.

RE-DIRECT EXAMINATION.

By MR. ANDERSON:

RDQ. 152. You have been sworn, Doctor?

A. I have.

RDQ. 153. In this case?

A. I have.

RDQ. 154. I think that will be sufficient. You are the same Harry D. Gibbs that testified on Friday or Saturday in this case, are you not?

A. I am.

RDQ. 155. Dr. Gibbs, you were appointed, or nominated by the Court and the Government to observe the experiment which the Court directed to be made by Dr. Freedman for the making of cinchophen which has been discussed in evidence here, and also pyruvic acid covering that product, also incidentally thereto the intermediate or ingredient called pyruvic acid. Did you attend upon this experiment in that capacity?

A. I did.

RDQ. 156. You have heard the testimony of Dr. Freedman as to where the experiments were held, the appliances used or provided, and the persons present, have you?

A. Yes.

THE COURT: Dr. Gibbs came in a little later, but you need not go through anything else. Bring him right down to the steps.

RDQ. 157. Now, Doctor, will you please tell the Court briefly, but as clearly as you can, exactly what took place at this experiment which it has been testified was held at Swarthmore College, dealing first with the experiments for the making of cinchophen, and secondly, with the experiment for the making of pyruvic acid, and tell us clearly in your own way as an officer appointed by the Government—nominated by the Government but appointed by the Court—

THE COURT: Appointed by the Government.

THE COURT: Mr. Kresel, are you concerned with having him go through all the steps of it?

MR. KRESEL: I just want the result.

THE COURT: Or are you satisfied to have him

say whether or not there was any departure from the steps of the patent and the quality and the quantity of the ultimate product.

MR. KRESEL: That is it.

THE COURT: Probably we can be of some service to Dr. Freedman by shortening the examination in that particular unless you want to go through the details.

RDQ. 158. You understood the Court's suggestion, Dr. Gibbs?

A. I did.

RDQ. 159. Tell if there was any variation from the patent exactly what took place and the ultimate result of the experiments in each case separately?

A. In regard to the experimental work of Dr. Freedman, I am prepared to state that in my opinion there was no variation from the patent. I realize, however, that on two minor points there may be differences of opinion. The first of these is referring to the making of a mixture, I believe the patent says, "simultaneously"—pouring two substances in simultaneously.

THE COURT: Let us get the patent and see where that is.

RDQ. 160. State what the patent says and exactly what variation was suggested as having taken place?

A. Under example 2, which states "106 parts by weight of benzaldehyde and 93 parts by weight of anilin simultaneously dissolved in alcohol."

In one experiment, Dr. Freedman dissolved one of these constituents in alcohol and added the other. In the other experiment, he did them simultaneously, just as carefully and to the best interpretation of the patent that any one could give. In my opinion it was absolutely simultaneous.

RDQ. 161. In which one did he dissolve them

separately and which simultaneously, the first or the second?

A. My recollection is that in the first experiment it was dissolved in the alcohol and the other added immediately, as soon as possible. In the second experiment, the "simultaneous" was carried out to the best of one's ability.

RDQ. 162. I would like to ask you if, in your opinion as a chemist, there is any material chemical difference in the two methods.

THE COURT: I am not concerned with that.

MR. KRESEL: I object to that.

RDQ. 163. All right, sir. Go ahead and tell exactly what took place?

A. In the same example, the second sentence reads, "to the boiling solution 88 parts by weight of pyroracemic acid," etc. One experiment was performed exactly as worded in the patent. The other experiment was performed on the basis of the pyroracemic acid being not quite pure, of about 94 per cent. purity. So, therefore on the interpretation that one should add 88 parts by weight of pyroracemic acid, the actual quantity of material weighed out should be a little more, which was done.

RDQ. 164. Do you know how much more?

A. I have the figures exactly, if you wish them.

RDQ. 165. Suppose you give them exactly.

A. The pyruvic acid was taken as 94 per cent. purity, which required therefore a weight of 93.6 grams to be employed on the basis of 88 parts. I think that is correct.

RDQ. 166. Was that in the first or the second of the experiments described by Dr. Freedman?

A. That was the first experiment as he performed them.

RDQ. 167. That is, the additional weight of acid

was used in the first experiment performed, as he described it?

A. Correct.

RDQ. 168. Proceed, Doctor, and tell the Court any other variations in either of the experiments, designating which one, if there was a variation.

A. I could discover no other variations from the specifications of the patent.

RDQ. 169. What was the result of the experiment?

A. The result in both cases was the substance that, if I may so state, I believe it is the agreement of the committee, is cinchophen. I have never personally worked on cinchophen before this, but there is no dispute upon this point as I understand the committee's report.

RDQ. 170. Then you would state to the best of your knowledge and belief that that was cinchophen?

A. It is cinchophen.

RDQ. 171. You heard Dr. Freedman's testimony. did you not, as to the amount of production and yield?

A. I did, in a rather loose way. I can not recall it. I think his figures are correct. I can give them from my own notes, if you wish them.

RDQ. 172. Unless you know of some variation from his figures as given in the two processes—

A. No, I do not.

RDQ. 173. —then it is unnecessary to repeat them it seems to me?

A. I have no doubt his figures are correct. We are in agreement on that. We weighed these things together and every one on the committee saw the results.

RDQ. 174. You were present during the entire experiment, or part of the experiments, were you?

A. I was present during the entire time of the work until 4 o'clock this morning, when there was

nothing of much interest going on and some of us were asleep and the Marshal told me I had better go to bed, which I did for two hours and a half, or three hours, I believe; so that during that time I was away and I do not know what happened while I was absent.

RDQ. 175. You left the other observers there, did you?

A. Everything was as it should be when I left.

RDQ. 176. Did Dr. Freedman show mental or physical strain while he was doing this work?

A. Yes, sir.

RDQ. 177. At what stages of the work?

A. After a few hours continuous work the strain began to tell, and I would say that on a scale of efficiency his efficiencey was gradually running down, which applies to my own observations at the same time.

RDQ. 178. Dr. Gibbs, I would be glad if you would state anything else you wish to add to what Dr. Freedman stated and what you have stated, to give a fair report to the Court of what took place as to cinchophen. I will take up the other one with you in a moment. Are there any other surrounding facts or circumstances or conditions that you think ought to be stated to the Court in order that he may have a picture of the situation?

A. I can only think of the question of yield, if that is material. There is no question but what the product is as it should be. The question of purity, we found that one product was purer than—the result of one of the experiments gave a product that was a little purer than the other experiment; but the yields were not very large. However, there were by-products —not by-products, but other products from the mother liquors that probably, so far as I know, contained cinchophen which could be worked up, thus increasing the yields. Of that I have no definite knowledge. The

process, of course, was carried through in as hurried a manner as it possibly could be done; and I can think of nothing else material to add.

By THE COURT:

Q. 179. The yield was what percentage of the theoretical?

A. (Referring to papers) The quantity of material taken out from the first experiment and regarded as the high grade material, showing the melting point of 210 to 211, gave a yield of 26.9 per cent of the theory, this, of course, not covering the crude product which was not worked up.

By MR. KRESEL:

RXQ. 180. As to which you know nothing, you say?

A. Nothing except that I saw it.

By THE COURT:

Q. 181. And that was experiment No. 1 or No. 2?

A. No. 1.

Q. 182. And No. 2?

A. In experiment No. 2 the same general statements can be made, the yield figuring, I believe, 14.3 per cent. This product seemed to be of a higher degree of purity, showing a melting point of 210.5 to 212 degrees Centigrade.

By MR. ANDERSON:

RDQ. 183. Were you present when the tests were made on this product?

A. I was.

RDQ. 184. What was the result with reference to the test indicating whether it was a product called for by the patent?

MR. ANDERSON: I don't know whether I need ask that.

THE COURT: Not unless there is some question

made of that, otherwise you need not press it. If there is, you can ask it on re-direct.

RDQ. 185. The other question I would like to ask is whether you observed the steps or the experiments for the making of the pyruvic acid?

A. I did.

RDQ. 186. Did you hear Dr. Freedman's testimony on that subject?

A. I heard most of it. I was here and a few of his sentences escaped me, but in general I heard it all.

RDQ. 187. Have you any additions to make, to what he said on that subject?

A. Nothing except that the process, while he was doing the work, I went into the library for a short period and got a book, I think published in 1881, descriptive of the process, and read it.

RDQ. 188. You read it?

A. I read it.

RDQ. 189. The results obtained in the experiment for pyruvic acid were as he stated them, were they, to the best of your knowledge?

A. They are.

MR. ANDERSON: That is all I want to ask now.

THE COURT: Did you read the book to Dr. Freedman—or just for your own information?

THE WITNESS: My own information.

THE COURT: Any cross-examination?

THE WITNESS: I might state, your Honor, if you please—

THE COURT: Yes.

THE WITNESS: That during the work as far as I could see Dr. Freedman consulted no literature.

RDQ. 190. Have you anything else to add?

A. Nothing that I can think of.

RDQ. 191. That the Court may know all the facts.

A. (No answer.)

MR. ANDERSON: You can stand aside, Doctor. I suppose counsel for the defendant will call the observers of the defendant now.

THE COURT: Yes.

(Witness excused.)

ELMER K. BOLTON, recalled by the defendant.

RE-DIRECT EXAMINATION.

By MR. KRESEL:

RDQ. 504. Dr. Bolton, I shall not ask you to go over the preliminary steps, I assume you were present throughout and observed. Please tell us what you saw, what the result was, what the yield was, and what the product was?

A. (Examining paper) In the first experiment on cinchophen there was a slight deviation, as pointed out by Dr. Gibbs, in the method of adding the ingredients. The denatured alcohol, the medium in which the reaction was carried out, had been measured out in a measuring flask and had been tared into an Erlenmeyer flask, which was then tared, and after the flask and the alcohol had been tared, then the requisite quantity of benzaldehyde was added. Then the requisite amount of anilin was poured into the flask, and that is the deviation in the first experiment which I observed.

RDQ. 505. The patents prescribing what method?

A. The patent prescribes the— I think I had better read it.

RDQ. 506. Yes.

A. 106 parts by weight of benzaldehyde and 93 parts by weight of anilin are simultaneously dissolved

in alcohol, the solution being boiled for about two hours. I do not suppose you wish to go into the intimate details of the process?

RDQ. 507. No.

A. After the reaction had been carried out for two hours, then the pyruvic acid was added, requiring a period of 50 minutes for the addition. The patent calls for the gradual addition of pyruvic acid, as discovered in the claims of the patent. After the reaction was complete, then the material was allowed to crystallize out, and further crystallization facilitated by cooling with ice water or an ice and water mixture. Then the product was washed with the mother liquor to rinse out all the material out of the flask, and then washed twice with benzol. denatured alcohol, which was supplied from New York, and then finally purified by heating with alcohol, substantially as described by Dr. Freedman. There was no variation there.

RDQ. 508. And are all those steps that you have just mentioned described in the patent?

A. The purification is not described—the exact method of purification. The patent, however, does call attention to the purification which can be carried out in the known manner.

RDQ. 509. I see. Now, have you finished the first experiment?

A. I have not stated the yields.

RDQ. 510. Now, please do that.

THE COURT: You have spoken so far of the first experiment only, I take it.

MR. KRESEL: That is my understanding.

A. I thought I would speak of the yields of the first experiment. The material was a very slight cream white in color. The weight was 67 grams amounting to 26.9 per cent of the theory. From the alcohol mother liquors, an additional quantity of a crude dark cream colored cinchophen was obtained

from the filtrate. This crude material, I presume, could be purified into good quality cinchophen, but I do not know. The product starts to melt at 197 degrees, that is a little on the top it begins to melt at that temperature, and at half melts up to 205 degrees, and all is melted at 210 to 211 degrees. That is substantially the same as reported by Dr. Freedman. The product gives an opalescence on dissolving in ammonia. I understand, but I do not know, that this is one of the tests prescribed by the pharmacopoeia specifications. I might add that the materials which were used in the first experiment—

RDQ. 511. Before you get to that, Doctor, as long as you are speaking about the pharmacopoeia, how about the product of the first experiment; was that such as would pass the test of the pharmacopoeia?

A. I have never seen those specifications.

RDQ. 512. You can not tell that then?

A. I can not tell definitely.

RDQ. 513. Very well. You may proceed.

A. The materials for the first experiment were supplied by Dr. Freedman. The materials of the second experiment were supplied by Doctor—

RDQ. 514. Before you go to the second experiment, Dr. Freedman testified that the product of the first experiment was not a marketable product. Do you concur in that?

A. I think Dr. Freedman's judgment is better than my own on that. The second experiment was carried out with materials produced by Dr. Alleman, with the exception of the pyruvic acid. There was no pyruvic acid, I believe, in stock, and Dr. Freedman supplied this material. The quantities of the experiment were half those taken in the first experiment; and as the result of the suggestion, this experiment was carried out according to the specifications of the second example in the patent.

RDQ. 515. Was the first experiment, according to the specifications in the first example of the patent?

A. I tried to point out that difference, that very slight difference, in the addition of materials.

RDQ. 516. With the reference that you point out, did the first experiment follow the first example in the patent?

A. No. I should have said that before work was carried out, Dr. Freedman informed us that he wished to follow the specifications of the second example.

RDQ. 517. I see. So that both experiments were under the second example of the patent?

A. Under the second example of the patent.

RDQ. 518. May I ask you there, Dr. Bolton—Dr. Gibbs has spoken of an increase of pyruvic acid that was made in one of these experiments; instead of 88 parts, there were 93.6 parts. Was that in the first or the second experiment?

A. That, according to my record was in the first experiment. I neglected to mention that Dr. Freedman—

RDQ. 519. Pardon me; so that in the first experiment there were two deviations; first there was the deviation in that the two elements were not poured simultaneously?

A. There was that deviation.

RDQ. 520. And then there was the second one in which there was an increase of one of the ingredients. My note here is that it was pyruvic acid. Is that correct?

A. That is true. The materials that Dr. Freedman used in this experiment, that is, the materials other than pyruvic acid, were assumed to be of 100 per cent purity. Now, he made an analysis of his pyruvic acid by specific gravity determination. I do not know anything about the accuracy of that method. But

as a result of that determination, Dr. Freedman added sufficient material to give 88 parts by weight of 100 per cent pyruvic acid. I would not call that a deviation from the set procedure. If the aldehyde were lower in quality, I think it is perfectly justifiable to add sufficient to give you the right amount of 100 per cent material.

RDQ. 521. Now then, we come to the second.

A. The second experiment was carried out with half the quantities employed in the first experiment. The alcohol used for the reaction was Cologne spirits, analyzing about 97 per cent. That was the analysis which Dr. Alleman reported. The benzaldehyde had been obtained from Magnus, Mabie & Raymond—I do not know anything about this firm—and the Kauhlbaum Aniline was used. The addition of the ingredients was made exactly as prescribed in the second example of the patent.

There was a slight deviation, which, at least to me, appeared of some significance. That is, a deviation from his first procedure in the addition of pyruvic acid. In looking over the patent and the references which are cited here in the patent, it seemed to me that the novelty of this patent, the salient feature of the patent, was the gradual addition of pyruvic acid, and you will note in the claims of this patent that there is a reference in each one of them to a gradual addition of pyroracemic acid, or pyruvic acid, and that called my attention to the particular method which was employed at that point in these experiments.

I have told you how the first experiment required a period of about 50 minutes for the addition of the pyruvic acid. In the second experiment (witness refers to papers)—I have that figure some place, if you will pardon me a moment, please.

RDQ. 522. Yes, take your time and get it.

A. According to my records, the addition began at two minutes after eleven and was complete at 29 minutes after eleven, requiring a period of 27 minutes.

I do not know whether there is anything in this particular point. I am giving you only my impressions. And I looked over the patent, the literature, the prior art, which was obtainable from these references, and I found that the reaction of making cinchophen had been known before from benzylidene aniline and from pyruvic acid; but here it brings out this one feature, the gradual addition, which appears in every claim of the patent. Otherwise, the experiments were about the same and there were no other deviations of any note.

RDQ. 523. What was the result of the second experiment?

A. In the second experiment, 17 and eight-tenths grams of material were obtained of a product of a cream color. It had little more yellow tinge than the first material. It was soluble in 17 per cent of ammonia hydroxide with a very slight opalescence. I think that if it were compared with the water standard, there would be what could be described as a slight opalescence. The melting point is 210.5 to 212 degrees. The particles darkened a little at 207 degrees. I might add that these melting points were made by Dr. Alleman after he had first made a check determination. They are not my own observations. I have taken his word. I know that he was making the melting point. I was there part of the time, but not so close in order not to create a draft around the apparatus. The percentage yield of theory in this experiment is 14.3 per cent. I believe I have given the weight of 17.8 grams.

RDQ. 524. Is that all you think you need state in this respect?

A. That is all.

RDQ. 525. How about the pyruvic acid experiment?

A. The pyruvic acid in this experiment was not assumed to be 94 per cent pure, but the quantity prescribed by the example of the patent was added. This is the experiment which I believe gives the best material, although the yields are lower.

RDQ. 526. How about the experiment to make pyruvic acid?

A. The experiment to make pyruvic acid—

RDQ. 527. Of course, we understand that in both of the experiments for cinchophen, all ingredients were supplied. They were not made by Dr. Freedman?

A. No, they were not made by Dr. Freedman.

RDQ. 528. Now, he attempted to make pyruvic acid. Tell us about that.

A. The reaction was carried out in an iron pot with a ground cover for a lid so that the pot was capable of holding a vacuum with the proper kind of a gasket. The pot was lined with asbestos paper and sodium silicate. I believe the reaction is a very drastic reaction; and in order to protect the apparatus, this precaution was taken.

The materials are essentially the same as Dr. Freedman stated, according to my records, 180 grams of potassium bitartrate and 347 grams of potassium bisulphite, to which a small undetermined amount of sodium bisulphite, sodium salt, had been added. I do not know the reason why. I think the sodium would act just the same as potassium, and it was, I think, to make up the deficit in weight. These materials were mixed until a rather uniform mixture was obtained and the pot was about half-filled.

There were no preliminary tests made to see whether the apparatus would stand vacuum, but it was assumed after set up it would be satisfactory. During the reaction, according to my observations, which were

made about 12:15 to 12:45, the vacuum was about 20 inches. Some material was obtained which amounted to about 136.5 grams. When I smelt it, it was sharp and pungent. I do not know anything at all about the pyruvic acid content of the material.

After the experiment was completed, a monometer was attached to the vacuum pump and showed that that pump was capable of pulling 26.5 inches of vacuum. The vacuum during the experiments, at the time when I made my observations, was being reduced somewhat by decomposition products. There were gases that were giving off, as could be readily seen, by bubbling through the caustic soda solution which was placed there to safeguard the pump from these gases.

RDQ. 529. Is that all you observed with reference to the last experiment?

A. Well, I have not gone into the smaller details of it.

RDQ. 530. I do not think it is necessary. What was the product obtained, if you know?

A. Well, the product—I do not want to say definitely what it was—I do not know. That is, there was not any analysis of it made. I do not think there is any question but that this reaction gives pyruvic acid in some quantity or other. Whether it is accompanied by considerable by-products, I do not know. I have had no previous experience with pyruvic acid.

RE-CROSS-EXAMINATION.

By MR. ANDERSON:

RXQ. 531. Dr. Bolton, did the experimenter in this case show the effects of physical and mental strain?

A. Yes, he did, Colonel Anderson. Toward the end, the efficiency of the man was quite low.

RXQ. 532. It was quite low?

A. Yes, it was.

RXQ. 533. As an experienced chemist, would you say that working as he did work, under the conditions that he did, that that would compare favorably with the man working in his own laboratory to produce stuff of this kind, with time to do it and average ordinary conditions?

A. Well, I think as far as the experiments on cinchophen are concerned—I do not know whether they could have been carried out much better or not. I think that one of the troubles was not losses in crystallization so much as quality of material that was produced in the reaction. Those experiments were started rather early in the morning before I observed any signs of fatigue. I think that perhaps better results could have been obtained with the pyruvic acid.

RXQ. 534. This is rather a difficult chemical process, is it not?

A. I have not had any experience with it. But it looks like a bad one. I saw how the material foamed and it would require constant attendance to carry out the reaction smoothly without having the material form into the tube connecting the pot with the condenser—and that material freezes quite hard.

RXQ. 535. He had no assistance from any source, did he?

A. No, sir; other than very trivial things, nobody assisted him in the experiments. He did the work alone.

RXQ. 536. He was under constant observation of the four chemists?

A. There was always one of us there. We spent most of our time in this room and only left the room for getting apparatus or something like that. We were confined to this room practically the entire day.

RXQ. 537. Are not results in chemical work, especially in delicate chemical work, largely affected by the conditions under which the man is working?

THE COURT: I do not know what you mean by that, Colonel Anderson. The witness may, but I do not.

MR. ANDERSON: I mean that I could not make an argument in this room after ten or twelve hours' standing on my feet to save my life. My mental forces would break down; and I want him from his experience to say whether those things do not affect a man in chemical work.

THE COURT: You mean, applying to the pyruvic acid?

MR. ANDERSON: Applying to pyruvic acid or any other reactions.

THE COURT: I notice you have included questions about the physical and mental strain. I do not understand why there was any physical strain, at least so far as making the experiments 1 and 2 with regard to cinchophen is concerned.

MR. ANDERSON: The physical strain there would be that the man had been in this work since 1 o'clock on Saturday. He had been getting ready for it. He was on his feet in the laboratory carrying on three experiments from 7 o'clock in the morning until that afternoon.

THE COURT: As I understood his testimony, the pyruvic acid experiment did not begin until 5:58.

MR. ANDERSON: That is true, if your Honor please, but he had not finished the other two then, as I understand it.

THE WITNESS: No, the work was not complete. The crystallization or purification of the product was not complete at that time.

RXQ. 538. It was not completed until late in the night?

A. No, it was in the morning that it was completed.

RXQ. 539. And there were three going on at once?

THE COURT: That was a third one that had begun.

RXQ. 540. And two up to that?

THE COURT: Only two during the day.

MR. ANDERSON: I should say, your Honor, that the purification was the one that required the greatest balance and judgment and mental poise and physical readiness to act, of any of them, and I wanted to ask the Doctor that question.

THE COURT: I do not object at all to your asking him. I want to understand myself.

MR. ANDERSON: I wanted the record to show exactly the conditions under which the man worked, not only for the benefit of the record, but as a duty to him.

THE COURT: I think that is right.

RXQ. 541. You understand my question?

A. May I have it re-read, please?

THE COURT: If you recall it, you can re-state it.

RXQ. 542. The question in effect, Doctor, was this, whether the conditions under which this man worked were favorable for fair results, or were the conditions such as would probably affect his physical and mental capacities in performing this work to get the best results?

A. Well, to get the very best results, I think that perhaps it did have some effect, but it depends a whole lot upon the physical condition of the man at the time he undertakes the work, and I do not know what it might have been in the case of Dr. Freedman. We have men in our organization who will work twenty-four hours, and carry out pretty difficult work. That

happens time and time again, particularly in starting out new processes.

RXQ. 543. But did this man show the effect of this physical and mental strain?

A. Well, he was quite tired. He was very tired toward the end.

RXQ. 544. Yes?

A. Yes.

By The Court:

Q. 544-A. This morning or last night?

A. This was this morning.

By Mr. Anderson:

RXQ. 545. And was he not engaged practically all day in association with you and others on Saturday and Saturday afternoon and Saturday night getting everything ready?

A. Well, I do not know what happened Saturday afternoon. We left here about eight o'clock Saturday evening and motored to Swarthmore and went to the laboratory about—my recollection shows 9:45. Then we began to look around for the best locations for carrying out the work, and that selection was made by Dr. Freedman, and then the selection of equipment began.

RXQ. 546. What time did you get through, Doctor?

A. According to my record, we left there at 11:45 P. M.

RXQ. 547. Standard time?

A. No, daylight saving time.

RXQ. 548. Where did you go then?

A. We walked back to the hotel. It required about a fifteen-minute walk.

RXQ. 549. And then you started the next morning at seven o'clock?

A. We arrived at the laboratory, according to my record, at 7:15. I have forgotten what time we got up.

RXQ. 550. What time did you leave the laboratory when the thing was over today?

A. I think we left about—

RXQ. 551. I mean what time did Dr. Freedman leave, of course.

A. Today?

RXQ. 552. Yes.

A. When everything was finished?

RXQ. 553. Yes.

A. I think he left first in the morning; I think it was about 5:35—I have not the exact record of that—and we went back to the hotel. Then we returned. I think it was after about an hour and a half.

RXQ. 554. And then stayed until about 10:30, left and came here?

A. Yes. Then the work was completed.

RXQ. 555. Dr. Bolton, in your opinion as a chemist, could you say whether there is any difference in results from these two ingredients not being poured simultaneously, as you said was the slight variation in the first experiment?

A. My observations in the past have led me to this conclusion; that the success of operations depends upon attention to the very smallest details. In the manufacture of dyes and intermediates we find that it is some very small detail that makes for the success of a process, and if that is neglected it has a very much wider, a more significant influence upon the results of the reaction than can be imagined. That, I think, is our general experience.

RXQ. 556. In the second instance or illustration he poured simultaneously—followed the exact terms of the patent?

A. Yes.

RXQ. 557. Did you notice any difference which led you to believe that the slight variation, not pouring simultaneously, but in the manner you have described, had any effect upon the resulting product?

A. I am not familiar enough with the mechanism of the reaction to tell whether it would or not. I do believe there is a theoretical possibility. He had his alcohol, and the aldehyde had been added, and then the anilin was added. I want to get this straight (examining paper). Yes, that should give him, I believe, as the chief product of his reaction the benzylidene aniline, as far as I can see theoretically. But if the aniline, for example, had been added first and the benzaldehyde added afterwards, you would have conditions there during the pouring in of the benzaldehyde where an excess of aniline was always present. Aniline and benzaldehyde are two reactive substances and it is possible to form two different compounds, one compound as prescribed in the patent, consisting of combination of benzaldehyde, one molecule of benzaldehyde, with one molecule of aniline. Where you have an excess of aniline present with only a small amount of benzaldehyde there is a possibility of having two molecules of aniline combined with one molecule of benzaldehyde, which would give you a product known as phenylmethylindianilin. There is that theoretical possibility. Now, when you add both of them simultaneously, you do not find large excesses of either one.

RXQ. 558. And you avoid that theoretical possibility?

A. That is a possibility on paper. I do not know how it is—

RXQ. 559. You saw nothing in the result from which you say that any such possibility took place?

A. No, you can not see anything.

RXQ. 560. To the best of your knowledge and belief, cinchophen was produced in both experiments, was it not?

A. As far as my training as a chemist goes, I believe that cinchophen was the product of the reaction, and in one case it was purer than in the other.

RXQ. 561. In the manner which you have described?

A. We, of course, have not checked up the constitution of these products by a carbon and hydrogen and nitrogen analysis, and to state definitely that this product is cinchopen it is necessary for us to do some work on it. I would not care to state that a melting point and the color of a solution in ammonia are definite identifications of this product as cinchophen.

RXQ. 562. And conclusive?

A. Yes.

RXQ. 563. But as far as they went, they indicated that fact, did they not?

A. I believe that cinchophen was the product in hand.

THE COURT: Colonel Anderson, I would like to know what the witness has to say about the yield.

RXQ. 564. Doctor, have you anything that you can say on the subject of the yield? I ask you in that general way; I am not cross-examining you.

A. I think that the yield speaks for itself, Colonel. There is a theoretical possibility of getting very much larger quantities than were realized in these experiments. I saw a yield of 53 per cent, I believe, mentioned in the second reference. That 150 per cent which they claim here works out to about 53 per cent of the theory, that is given in the specification of the patent.

RXQ. 565. Anything else that you can say on that subject? Do you know the purpose of this inquiry?

If you can enlighten the Court in any way, I am perfectly willing to have you do it.

THE COURT: From a practical standpoint; a commercial standpoint as well as a laboratory standpoint.

A. From a commercial standpoint these yields would be entirely too low. They would never permit the commercial manufacture of the product.

MR. KRESEL: Are you through, Colonel?

MR. ANDERSON: Yes.

THE COURT: I want Colonel Anderson to make such inquiries with respect to my last question as he may desire to make.

RXQ. 566. Doctor, you have no way of knowing, have you, what commercial results Dr. Freedman has obtained in his experiment on this work in 1917, about which he testified?

A. No, sir.

RXQ. 567. Is it not often the experience that in an experiment carried out under new conditions, with new instruments, under pressure, and with observers of such high standing as yourself around to make them nervous, that we do not get the best results the first time or the second time?

A. It depends upon the familiarity of the chemist with the process, I think, to some extent.

RXQ. 568. Dr. Freedman testified that he had not actually carried out this process since 1918 at all. Would you think that would have any bearing upon the question of his success on the first effort?

A. I am under the impression, however, that the testimony has been given that he had two years experience.

RXQ. 569. Yes, he did; he said he started in 1917 and quit in 1918.

A. If that was the case, I would expect a chemist

to know pretty well what was taking place in the reaction; after two years experience with the reaction, chemists ought to know it very intimately.

RXQ. 570. Would you or would you not think that operating under the conditions that he was operating, it would be most probable that in two experiments carried out at the same time he would have some difficulty in getting the best results?

THE COURT: I will let you take that answer, but you will recall that the condition was that he could elect to carry on one, two or three, as he desired. So I am afraid he will be estopped from setting that up, although I will let you take the answer if you want it.

MR. ANDERSON: I would not want to argue that question to your Honor at this time; but I would want to argue it later.

THE WITNESS: Do you wish me to answer?

MR. ANDERSON: Yes, I wish you would answer that, Doctor.

A. I think it depends a great deal upon the temperament of the chemist. Some men can only do one thing at a time, and they are good chemists at that; other men can carry on two or three things. If I were in the same position, I know that with my own temperament I would very probably be—my work would be somewhat affected.

RXQ. 571. You do not know, of course, Dr. Freedman's temperament?

A. I have never met him prior to this time.

THE COURT: Are you through?

MR. ANDERSON: Yes, sir.

THE COURT: Anything further?

MR. KRESEL: Nothing further.

(Witness excused).

MOSES L. CROSSLEY, resumes the stand.

RE-DIRECT EXAMINATION.

By MR. KRESEL:

RDQ. 278. Dr. Crossley, without repeating anything that the other witnesses have already testified to, I am going to ask you the broad question to state what you observed with reference to these experiments, two on cinchophen, and the other on pyruvic acid?

A. In regard to cinchophen, in the first experiment Dr. Freedman departed from the patent specifications in one particular respect, and that is, in not adding the benzaldehyde and aniline simultaneously as called for in the patent.

RDQ. 279. What, in your opinion, was the effect of that?

A. In my opinion, that is an important point.

RDQ. 280. Will you explain why you think it is an important point?

A. I might add that while I have no theoretical grounds on which to elucidate that point, my general experience in dealing with this particular product has taught me that better yields are obtained by the conditions under which the first experiment was carried than under the conditions of the second experiment, which was conducted exactly as specified in the patent.

RDQ. 281. How was that reflected in the yields?

A. The yield in the first place was 26.9 per cent; but that is a yield of an impure product, a product which has been mentioned here melted at 210 to 211, but that is not correct. The record shows that the melting point of that particular product was as follows: The melting point started—the product started to melt at 197. Half of that product melted at 205 and the rest of that product melted between 210 and 211.

Now, any chemist knows that a product that begins to soften or melt at 197 and continues through a

number of degrees, as stated here, 197 to 211, is impure. That product is also demonstrated to be impure, recognized by Dr. Freedman to be impure, by the ammonia test, which showed insoluble on the ammonia test, which also confirms the melting point test.

The color of that product is fairly good, I will say. I think in comparison with the standard cinchophen the color of that product would be, in my judgment, about a grade B product. If I should take this product as a standard, I think that the product obtained by the first experiment is a little darker in color; more of a yellow shade. These samples are available, and I think it would be highly instructive to have the samples while we are talking about them. They are in the custody at the present time of the Marshal.

THE COURT: Marshal, will you bring in the product?

(Box produced by Marshal.)

RDQ. 282. You were going to point out how, in your opinion, the departure in the first experiment was reflected in the yield. You had spoken of the yield of the first experiment. What about the yield of the second experiment?

A. In the first experiment I should add that Dr. Freedman used, of course, all his own materials. Pyruvic acid has been questioned. The pyruvic acid came in small bottles sealed. I think we have a specimen of that pyruvic acid in these specimens.

That pyruvic acid is a German-made product, sold and purchased by Dr. Freedman, apparently, in this market, in small quantities, small bottles. That product he thought was impure by the specific gravity determination. I did not agree, as a chemist, knowing a good deal about pyruvic acid, I do not think that the specific gravity is a true criterion of purity in pyruvic acid, and therefore I objected at the time, but passed it

on as an agreement among the others that he should use whatever he decided was best for his experiment.

Now, another regard: The patent says nothing about the method of purification. The patent says that the product is purified in the well-known way. Just what that is, I do not know. We did not interfere. Dr. Freedman proceeded in the purification as he thought best.

I have here what—I think I have got everything, a complete record of what he did. There are several steps in the purification, and yet the ultimate product obtained is not pure as compared with the product which has to be sold. A product which melts between 213.3 and 213.5 is the product which we sell in this market and which we guarantee under our name of "Calco Brand," for quality.

Also this product has a color grade A. Also the product is soluble, completely soluble in ammonia. This product was not completely soluble in ammonia, but showed considerable opalescence. Also I thought that point was agreed to by all the men on both sides, and there is no question about the statement as to its melting point, because Dr. Alleman took the melting point himself, and we all agreed to accept that.

RDQ. 283. Is there a prescribed test by the United States Pharmacopoeia with reference to this drug? There is the pharmacopoeia—

RDQ. 284. How does the product of the patent by the first experiment compare with it?

A. It is impure compared with it and would not pass the pharmacopoeia—

THE COURT: You are speaking of pyruvic acid?

MR. KRESEL: No, your Honor, we are speaking of cinchophen from the first experiment.

THE COURT: Go ahead.

A. (Continuing) The Pharmacopoeia calls for a

product which melts at about 210. This product starts to melt at 197. The pharmacopoeia requires also it should be completely soluble in ammonia.

RDQ. 285. And you said this was not?

A. It was not. On the solubility of ammonia, that is the way I remember it, I do not happen to see it on this leaflet at the present time although I am not reading it very carefully.

RDQ. 286. What have you to say as to the second experiment, doctor?

A. The second experiment, after it was called to Dr. Freedman's attention—

RDQ. 287. After what was called to his attention?

A. That the first experiment had not been carried out in accordance with the patent, exactly in accordance with the patent and specifications—he proceeded in accordance with the patent and specifications, adding the materials simultaneously. The result of that experiment was, as has been stated, a very much lower yield, although a product which had a better melting point, but would not pass on color, and that yield was 14.3 per cent of theory.

RDQ. 288. Dr. Crossley, with such a yield as 14.3 per cent of the theoretical, would it be possible to commercially produce this product?

A. No, it would not, in my judgment. I also want to call to your attention the fact that this 14.3 yield was obtained with "C. P." materials.

RDQ. 289. What does that mean?

A. Chemically pure materials, which could not be obtained in this market. By chemically pure materials, I mean that they were put up under the seal of firms well known in the trade to deliver chemically pure materials. They were not tested for purity.

In this experiment No. 2, Dr. Freedman used alcohol delivered to him by Dr. Alleman. This alcohol is known as cologne spirits. It is supposed to be one of

the best grades of alcohol we have. I think Dr. Alleman said it contained 97 per cent alcohol. He used a benzaldehyde, the bottle of which had not been opened, it was sealed when he received it. It was labeled "Oil of bitter almonds," which is supposed to be an excellent grade of benzaldehyde made by Magnus, Mabee & Reynard. He used an anilin of Kauhlbaum's make, with Kauhlbaum's label, the bottle of which had not been opened.

RDQ. 290. It is Kauhlbaum's product?

A. A Kauhlbaum's product made in Germany. I beg your pardon, it was not in a bottle, it was in a tin container which had not been opened. So far as the purification is concerned, he varied purification here somewhat in detail. Instead of carrying out the purification in the various steps with benzine and alcohol, in some of these steps the process was somewhat reversed. I do not know that that makes very much difference.

RDQ. 291. Have you stated now all that you desire to state as far as your observation went, with reference to the two cinchophen experiments?

A. No, I particularly wanted to make the statement; on this witness stand I made the statement that as a result of this patent there was obtained cinchophen and tar, chiefly tar. I make that statement now again, as our experience in this mother liquor, which I am going to show you here, is a product which I call tar. Our experience has taught us that we cannot take that tar and convert it into cinchophen to 100 per cent yield. While it is possible to get perhaps a small part of cinchophen out of it, and that perhaps varies in degree of purity, and after a long and tedious process you perhaps, will get some cinchophen out of that, to build a yield up from 14.3 to a practical yield, in my judgment, is impossible.

RDQ. 292. What would you say about the costs of the materials that were used to produce this 14.3 per cent of the theoretical yield?

A. Of course, I have not had the time since I returned, in view of the fact that I have not been in bed since, or have not slept since Friday night, and in view of the fact that the gentleman who is supposed to have collapsed, did get some sleep and I got none at all last night—although I am not offering that as an alibi—I have not had time to check these figures, but I think the cost will be demonstrated to the Court to be considerable. The material that was purchased here, as purchased in small quantities, is very expensive, and could not be considered on a commercial basis at all.

RDQ. 293. What about the pyruvic acid experiment?

A. Oh, pardon me, I would like to add, the question has been raised as to the quality of pyruvic acid in the second experiment. I am not certain that there is a specimen of it here. The pyruvic acid was also in a sealed bottle, a Kauhlbaum product imported from Germany. The color of that pyruvic acid was a little darker than the color of the pyruvic acid used in the preceding experiment.

I witnessed the attempt of Dr. Freedman to make a specific gravity determination on that product as well as on the former one. I think, although I am recalling now a memory of early this morning, that we both agreed that so far as the specific gravity is concerned, it was satisfactory, although I am not absolutely certain of that fact. However, I will state there again that I do not believe that a specific gravity on pyruvic acid is a criterion of importance.

RDQ. 294. Could you by stepping down here pick out from this mess the result of the first experiment?

A. (Witness leaving stand) This is the pyruvic

acid that was purified in the first experiment (indicating).

THE COURT: Cinchophen?

THE WITNESS: Cinchophen, yes, sir, which melts at 197, or starts to melt at 197, half melts up to 205, and the remainder from 210 to 211.

RDQ. 295. That is so written on the label?

A. Written on the label by the Marshal. The product of the second experiment is here (indicating). It is also labelled by the Marshal Sample No. 2. It began to darken at 207, the black particles forming at 207, melting completely between 210 and 212 and one-half, reading from the right.

RDQ. 296. That shows the mother liquor, so-called?

A. This is the mother liquor of the No. 1 experiment (indicating), in which I claim there is chiefly tar, or the difference between the yield of 26.9 as represented by this product (indicating) and these two products (indicating). This is the impure 15 grams (indicating) to which your attention has been called. This product (indicating) was obtained and was not purified this morning, although had the experience of purifying this been continued three or four further washings would have been necessary to get it to this purity, in my judgment.

This is the mother liquor from No. 2 experiment (indicating). I particularly want to call your attention to the difference in color, which is reflected in the difference in yield. This product (indicating) goes with this product (indicating). This is 14.3 per cent yield on the basis of 100 per cent possible. This contains the remainder (indicating). This is one of the bottles from which the pyruvic acid was taken that was used in the first experiment. This is an unused sample of the same pyruvic acid, still labelled with the paper around it, not opened, made in Germany and purchased from C. A. F. Kauhlbaum Chemische Fab-

rik. This is another sample (indicating) or bottle representing the same product.

By the way, these are several of the same bottles of pyruvic acid used (indicating). This is a sample of the aniline furnished by Dr. Alleman used in experiment No. 2, Kauhlbaum's aniline, marked on the bottle by the Marshal "Unopened can." This is the benzaldehyde, U. S. P., from the U. S. P. Chemical & Drug Company, used in the first experiment and obtained by Dr. Freedman. This is the crude pyruvic acid or crude product which Dr. Freedman obtained as pyruvic acid (indicating).

RDQ. 297. Have you a sample of pyruvic acid here?

A. I have. This is glacial pyruvic acid, melting point 10.8. That is the pyruvic acid is a product the purity of which can best be obtained by freezing or getting a crystalline product which can be identified, because the product decomposes at high temperature. This as a product by Dr. Freedman (indicating).

This is the Cologne spirits of alcohol furnished Dr. Freedman for his second experiment by Dr. Alleman. This is the benzaldehyde from Magnus, Mabee and Reynard, "unopened bottle" marked on the label by the Marshal and furnished to Dr. Freedman for the second experiment by Dr. Alleman. I have one of the bottles of the pyruvic acid used in the first experiment, made in Germany, with the label on the bottle, obtained from Kauhlbaum. This is the denatured alcohol, benzene denatured alcohol, used by Dr. Freedman in his first experiment, supplied by me. This is the aniline oil he used obtained from the Chemical & Drug Company, 114-118 Liberty Street, New York. These are the products he used, which are marked on the label, "C. P. Chemical & Drug Company" in the production of this pyruvic acid. This is the potassium bitartrate analyzed by the Baker Chemical Company,

a firm of high reputation—"sodium bisulfate C. P." marked on the label.

RDQ. 298. Dr. Crossley, what is the melting point of the cinchophen that is produced by the Calco Company?

A. 213 and a fraction; as a rule. Our cinchophen as a rule melts within one degree.

By THE COURT:

Q. 299. Melting begins when?

A. In that sample, 213.3 to 213.5.

By MR. KRESEL:

RDQ. 300. Is there anything else?

A. As to pyruvic acid, I would like to add one statement, since the question of pyruvic acid has been asked. I made this statement to the committee or to the group there and I want to make it clear to the Court. This man tried to make pyruvic acid with the information secured in our plant in working there two years. Pyruvic acid is made possible on a commercial scale only by certain information which he secured, that enables a manufacturer of pyruvic acid to use tools which will stand corrosive action of the pyruvic acid. This man demonstrated or tried to demonstrate the production of pyruvic acid by using the information he secured in our plant to protect the tool for so doing.

MR. ANDERSON: I wish to make a statement to the Court, sir, that he was doing this under the orders of the Court. He said that he had made this stuff. But that was not covered by the patent and at the suggestion of counsel for the defendant, the Court asked that he make the pyruvic acid also. It is not covered by the patent; it is not under the patent; and he was required to do this on the suggestion of counsel for the defense and by order of the Court.

MR. KRESEL: I do not recall that I made the suggestion. I think the Court made the suggestion.

THE COURT: I think the Court did request that he make pyruvic acid, because as I recall his testimony in chief, he said he made the pyruvic acid from which he made his cinchophen; and he made them both in 1917.

MR. ANDERSON: Quite true.

RDQ. 301. Was your company making pyruvic acid at that time?

A. It was.

RDQ. 302. Is this the pyruvic acid produced by Dr. Freedman?

A. That is a sample produced by him.

RDQ. 303. How about the odor of that and the pyruvic acid that you have produced. Is there any difference in those, can you tell?

A. There is a slight difference. His product, of course, has other things in it that contaminate the odor. This, being a glacial product, of course is stronger.

RDQ. 304. Dr. Crossley, Dr. Freedman testified on Saturday that not only did he succeed in making cinchophen the very first time that he tried it in the Calco plant—

THE COURT: Are you going outside of the experiment now?

MR. KRESEL: I was going outside.

THE COURT: If you want to go into that, I think it had better be reserved for another time in your sur-rebuttal proper. This witness is now called as one of the observers of this experiment.

MR. KRESEL: Very well, your Honor.

MR. ANDERSON: If the Court please, I asked for the production of Dr. Crossley's notes of his effort to make cinchophen.

RE-CROSS-EXAMINATION.

By MR. ANDERSON:

RXQ. 305. At Jewell College, was it?

A. No, sir; I have never made cinchophen at any college.

RXQ. 306. Did you ever try to make it?

A. I have never made cinchophen myself by my own hands anywhere, nor did I say so on the stand. I say I directed the work of other men making it at the Calco Chemical Company.

RXQ. 307. Have you any notes on the subject?

A. The Calco Chemical Company has records which are not my personal records.

RXQ. 308. Of your own production?

A. Not records of my experiments, no, sir.

RXQ. 309. Then you have no records of your experiments at all upon the subject and in fact have never made any experiments?

A. I have made no experiments with my own hands. I have directed the work of other men.

RXQ. 310. Does that apply to the other drugs as to which you testified?

A. It does; yes, sir.

MR. ANDERSON: I also called for the production on last Saturday of the books of the Calco Chemical Company showing the details of their so-called research costs which were testified to by Dr. Crossley.

MR. KRESEL: That is a question, your Honor, that does not come up now while this man is on the stand.

MR ANDERSON: I want to raise it now because I want to reserve the right at the proper time so there will be no question of my being estopped, not at this time, but later.

I also at this time wish to ask for the pro-

duction of the note books left by Dr. Freedman with the Calco Chemical Company of his work there at the laboratory.

THE COURT: Have you any cross-examination of this witness with respect to his observations?

MR. ANDERSON: I have not, sir. That is all.

MR. KRESEL: That is all.

MR. ANDERSON: I do want to ask leave to ask one question.

RXQ. 311. You said that the melting point provided by the pharmacopoeia was 210, did you not?

A. 210, yes, sir.

RXQ. 312. What was the melting point, the accurate melting point of the first product?

THE COURT: The product of experiment No. 1?

RXQ. 313. Yes, sir; the actual melting point; where did it actually melt?

A. I will give you that, sir. The product began to soften at 197, half of it was melted at 205 and the remainder between 210 and 211.

RXQ. 314. What was the actual melting point of the product on the second experiment?

A. It began to darken, or black particles formed at 207, and was completely melted between 210 and a half and 212 C.

MR. ANDERSON: You can stand aside, Doctor.

THE COURT: What were those last figures, please?

THE WITNESS: Between 210 and a half and 212 C.

(Witness excused.)

THE COURT: In order to save counsel on either side any embarrassment, I will call Dr. Alleman, and you may each proceed to examine him as in cross-examination.

GELLERT ALLEMAN.

GELLERT ALLEMAN, was called as a witness, and having been duly sworn, testified as follows:

Examination by THE COURT:

MR. ANDERSON: May I make the suggestion that your Honor ask the questions that will interest you.

THE COURT: I will ask one general question and then you can make any inquiries on either side that you like.

Q. 1. Dr. Alleman, you were appointed by the Court to observe these experiments made by Dr. Freedman. You may stand or sit as you like, I think. I assume that you did observe them, and I will get you to tell us what you observed. What was the result of the experiments, wherein the experiments followed the patent, and wherein they departed from the patent, if at all; and then outside of the patent tell us what you observed with regard to the making of pyruvic acid?

A. Do you wish me to detail all that which has gone before, when we left here, or shall I be very brief?

Q. 2. Be as brief as you like and then let counsel on either side go into such details as they desire.

A. The time I occupied in these experiments, with two interruptions, was twenty-six hours and thirty-five minutes, from the beginning to the time when the dried materials were obtained, to the melting points of the two dried materials determined by me. Insofar as I am able to determine from my general knowledge, I should say that the products of the two materials might be determined essentially cinchophen. None of the chemicals which were produced by Dr. Freedman, and

none of the chemicals which were produced by me have been analyzed, but we have every reason to believe that they are the substances which have been labeled. In the first experiment, in the manufacture of cinchophen, a yield of 26.9 per cent of the theory was obtained. That material had a melting point from 188 to 209¾, one portion. Another portion had a softening point of 197. Half of which melted at 205, and the remaining half at between 210½ and 211. That was known as experiment 1, wherein Dr. Freedman used his personal chemicals, operating on materials furnished by me, with the exception of the pyruvic acid which was furnished by him. He obtained a yield in the second experiment of 14.3 per cent of the theoretical. That material after being purified, melted between 210 1-2 and 212. In the first experiment the materials were not added simultaneously? In the second experiment the materials were added simultaneously.

Q. 3. Did you notice any departure—have you finished?

A. No, sir, I am trying to think—

Q. 4. I will postpone what I want to ask you.

A. I observed, and it puzzled me much why, with the materials which I furnished operating in accordance with the patent yielded only 14.3 per cent of the purified product, which had a rather good melting point; whereas, with the materials furnished by Dr. Freedman, operating in a slightly different manner than is specified in the patent, there was yielded 26.9 per cent of a material which had a very much larger range of melting point. Ordinarily—may I give an opinion here?

Q. 5. Yes.

A. Ordinarily, I should not consider that the addition of materials simultaneously would much affect a reaction, but I confess that the results of the operation indicate to me that there is something in the caution

to add these materials simultaneously. Since I have heard some of these witnesses, I can conceive of a number of reactions, which, when taken place simultaneously, and removing from the field of action by solution, certain products which are formed, might and probably do, account for the formation of such impurities as I have indicated. Dr. Freedman was furnished at our laboratory with absolutely everything he asked for, and I think he has been perfectly satisfied with the materials which were offered. That is all I have to say about the first experiment.

Q. 6. And the second?

A. In the second experiment, in the manufacture of pyruvic acid, he operated, as has been described here—I have no criticism of any of the testimony in that regard which has been produced—and he obtained a material, a sample of which is here in Court. I know nothing about that sample, except that I saw it weighed, and I saw it dropping off from the condenser. I have not examined it. I do not know whether it is pyruvic acid.

THE COURT: You may proceed, Colonel Anderson, with such inquiries as you like.

By MR. ANDERSON:

Q. 7. Doctor, when you spoke of the product of the two materials being cinchophen, did you mean two experiments or two materials?

A. I beg your pardon.

Q. 8. I say did you mean two experiments. You said the product of the two materials was cinchophen.

A. I mean the two experiments.

Q. 9. I thought you used the word "materials" in place of "experiment."

MR. KRESEL: He did not say it was cinchophen. He said it might be termed essentially cinchophen. Those were his words.

Q. 10. This man worked practically 26 1-2 hours, did he?

A. Yes, sir.

Q. 11. Did he show strain?

A. He did.

Q. 12. To any degree, to any considerable degree?

A. Considerable degree.

Q. 13. As he has expressed it, you did everything that anybody could do to facilitate his work, he expressed that on the stand, but do you think the conditions surrounding his work, and the continued period of work in which he was engaged, taken into consideration the type of man, were favorable to the best results?

A. So far as the material equipment is concerned, I may say, sir, that he was offered everything.

Q. 14. Yes. He said so too.

A. So far as the mental and physical strain is concerned, he certainly was handicapped.

Q. 15. No assistance was given him, except to furnish him the supplies?

A. I supplied everything to him. I carried it to him, but did not interfere with his apparatus.

Q. 16. Of course. Dr. Alleman, as to the slight variation you speak of, have you satisfied yourself as yet, whether there was any real effect resulting from that variation of not pouring together one following the other, or is that rather drawn from the results, that opinion?

A. I have not satisfied myself, but I have been thinking about it since I examined the two products and considered the different yields.

Q. 17. Yes; and that to your mind offers one possible solution of what seems to you rather a mystery in the situation, is that about the statement of the fact?

A. Yes, sir.

Q. 18. That is about as far as you can go at this time?

A. Yes, sir.

Q. 19. As to the pyruvic acid, you said you had not made the test, as I understood Dr. Freedman to say, that was completed at a very late hour, and that yet remained to be purified, is that true?

A. That pyruvic acid experiment was discontinued at 5:35 this morning, and we have had no opportunity to test it since.

Q. 20. And after its discontinuance, he stated that he had not had a chance to carry it through to the process of purification, the known processes of purification, he did not have an opportunity to do that as far as you know, did he?

A. No, sir.

Q. 21. Are you prepared to say, to the best of your knowledge and belief, Doctor, based upon the facts which you have recited to the Court, and which have been recited here, Dr. Freedman did produce cinchophen, as cinchophen—I believe it is—under the process named in this patent?

A. Yes, sir, with the exception which I have already noted in regard to the variation.

Q. 22. In the one experiment?

A. Yes, sir.

Q. 23. No exception in that other experiment?

A. No, sir.

Q. 24. Where he followed the exact terms of the patent?

A. No, sir.

THE COURT: There is one question. Somebody has mentioned here something about the addition of pyruvic acid, in the second experiment, I think it was.

MR. KRESEL: No, sir, that was in the first experiment.

THE COURT: The first experiment.

By THE COURT:

Q. 25. What have you to say about that, Doctor, if anything?

A. Dr. Freedman—you mean the quantities?

Q. 26. The quantity.

A. Yes, Dr. Freedman determined the specific gravity of the pyruvic acid furnished by Kauhlbaum, but informed us it was not 100 per cent, and he desired to add an additional amount in order to bring up that amount to 106 grams, or whatever the amount was.

Q. 27. Do you happen to know anything about the specific gravity, whether it was accurate or not?

A. I do not.

MR. ANDERSON: Just one second. I was looking at some notes and did not catch the question by you and his reply. Would you read the question? (Record repeated as recorded.)

By MR. ANDERSON:

Q. 27A. Did you have any reason to believe that the statement of Dr. Freedman, on this point, Dr. Alleman, was in any respect different from the facts as to this acid?

A. None whatever, sir.

Q. 28. He made chemical tests of the acids before he made that statement, did he not?

A. He did.

Q. 29. I believe that you said that the product of the first experiment began to darken a little at about 197, half melted at 205, and all melted at 210 to 211; is that right?

A. Yes, sir.

Q. 30. And that the second product began to darken a little at 207 and melted between 210 and 212 1-2.

MR. KRESEL: 210 1-2 and 212.

MR. ANDERSON: It is marked "210" and "212 1-2."

THE WITNESS: 210 1-2 and 212.

MR. ANDERSON: Then it is marked wrong.

Q. 31. Is it not usual in a substance of this character for it to begin to show a little coloration just before the melting point is reached?

A. In commercial substances, yes, sir. It indicates the impurities present.

Q. 32. The one that melted from 210 1-2 to 212 was the second experiment where he followed exactly the language of the patent; is that true?

A. Yes, sir.

MR. ANDERSON: I think that is all.

MR. KRESEL: No questions.

(Witness excused.)

MR. KRESEL: Now I would like to ask Dr. Freedman a few questions.

LOUIS FREEDMAN, resumed the stand.

THE COURT: Are there any further questions you desire to ask him at this time, Col. Anderson?

MR. ANDERSON: I do not think so, sir. None occur to me at the moment.

THE WITNESS: If your Honor please, may I make a few statements in order to indicate my position?

THE COURT: Yes. Is there any objection, Mr. Kresel?

MR. KRESEL: No, sir, none whatever.

THE WITNESS: Regarding the so-called deviation from the patent, as described by some of the men who acted as witnesses: when I started this experiment I first had the alcohol in my flask, 200 c.c., and then I added 106 grams of benzaldehyde.

Just as soon as I added the benzaldehyde, the significance of the word "simultaneously" occurred to me, and I, the first one, called the attention of the gentlemen to the fact that perhaps there may be some discussion about that word "simultaneously," and I immediately, as quick as I could, added 93 grams of aniline, and everyone present agreed that under the circumstances they would consider it as simultaneously.

Now then, when I first made this experiment in 1917, that was the way I construed the patent, and that was the way I first made the experiment.

When benzaldehyde is added to aniline, benzylidene aniline is obtained. When aniline is added to benzaldehyde, benzylidene aniline is obtained, either without any solvent or in the presence of alcohol. The compound formed is what is known as a Schiff's base. An aniline reacts with an aldehyde, giving what is known as a Schiff's base, with the elimination of water. That is a common reaction. In this present case no other compound could be formed.

Dr. Bolton testified on the stand that in the presence of an excess of aniline, he said that the only possible difference that might occur to him—theoretical difference—was that in the presence of an excess of aniline you might get other compounds formed. In my testimony, and in the testimony of the other witnesses, they have said and I have said, that I added the benzaldehyde first and the aniline after.

Therefore, there could not have been an excess of aniline, because there was all the time present an excess of benzaldehyde. I did not intentionally divert from the patent. It was while carrying on the reaction, and as I remember having carried it on the first time while in the employ

of the Calco Chemical Company, and as I construed the patent, I started to carry the reaction that way, and it immediately occurred to me about the word "simultaneously."

Now then, while in the employ of the Calco, I also carried on experiments to find out the significance of adding benzaldehyde and aniline together or separately, one after the other, in solution, without solution, and I could find no essential difference.

The patent states 93 parts by weight of aniline are slowly added while stirring, to 106 parts by weight of benzaldehyde, while at a temperature of about 40 to 50 C. When these two reagents are added together, the reaction takes place—what is called exothermo reaction—with the elimination of heat, and water is formed in the reaction.

According to part 1 of this experiment, the compound obtained is benzylidene aniline. This benzylidene aniline is then reacted with pyroracemic acid in the presence of alcohol, either after purification or as such.

According to the first part of the patent then, the adding of aniline to benzaldehyde does not make any difference, because the patent says so. I can add aniline to benzaldehyde because I get benzylidene aniline. Therefore why should it have any difference in the second part of the patent?

Every chemist knows that interpreting the word "simultaneously" means that the authors of the patent wanted this compound not to get overheated, as said in the first part—40 to 50 degrees Centigrade, and the second part is done in alcohol. Therefore, they wanted it stirred together, and when it is added simultaneously in the presence of alcohol, there is no superheating. By

"simultaneously" I at first construed that to mean to get them together as quickly as possible, no waiting; and adding one and then the other immediately after, certainly lives up to that specification.

If it please your Honor, may I have a moment to look this over?

THE COURT: Take your time.

THE WITNESS (after referring to papers): According to the testimony given in which I inadvertently stated, I believe—I am not sure—I used a little more pyruvic acid in the first experiment than was called for in the patent. The patent calls for 88 grams and I used 93.6, or 93.4, I believe—93.6 is correct.

While in the employ of the Calco Chemical Company I was authorized to undertake research work with the assistance of a chemist by the name of Mr. Swenson. This piece of research work was the determination of specific gravity tables of pyruvic acid.

We prepared what we considered 100 per cent pyruvic acid by several—I do not remember the number, but there were many—vacuum distillations of pyruvic acid, and subsequent analysis of the acid by titration with normal alkali.

This was checked up in other ways—I have not got the figures; they are in the note books which are the property of the Calco Chemical Company—and Mr. Swenson and myself prepared tables. We used this 100 per cent pyruvic acid, and by the addition of various amounts of water we prepared various percentages of acid, and those tables were taken by the Calco Chemical Company as accurate, and they were framed and put up in the plant in Building 25 and used as accurate determinations for pyruvic acid by the

foreman when he designated a job to the employees, or when any of the employees added the acid. They referred to those tables and they considered them as accurate.

I have a copy of those tables, and I use them as my own personal privilege; but I have never or will never divulge them to any other concern. It being my work, I have the personal privilege of using them for my own interest. That is construed as ethical among the chemists and scientific men.

Furthermore, the patent says: "In the foregoing examples the quantities of the reagents may, of course, be varied." That explains itself.

Dr. Alleman testified that the fact that I obtained a low yield with a high melting point in experiment 2, and a high yield with low melting point in experiment 1, was a puzzle to him. Well, I can easily explain that puzzle in this way: That the reaction in the preparation of cinchophen, when you get a too highly-iced exothermo reaction—by that I mean giving off of heat in both parts of the reaction—you will get variations.

You can run the same experiments, two experiments, identically the same, and you may obtain variations. It cannot be explained. It is chemistry. No one knows why.

Between the gentlemen who testified here and myself the purity of the various products which I prepared was described. My compounds—compound No. 1 I admitted was not up to the present-day standard of cinchophen, but I stated and I here reiterate that I am capable within one hour's time of taking that compound and putting it through at least one or at most two steps with the loss of not more than four or five grams, and I will obtain pure stuff which will satisfy the

melting point or the criterion of the U. S. Pharmacopoeia. The compound that fails to dissolve in ammonia is a compound melting at 228. It was isolated and found, but the composition never determined. This compound is always, or it is pretty near always formed in that reaction.

As a matter of fact, there are three or four side reactions there. The bulk of the compound formed is cinchophen, of course, but there are at least two more that I know of, and some tarry substance which is due to polymerisation, and this compound melting at 228 is always present and makes a lot of trouble in the melting point. A very minute amount of this substance will cause a considerable drop in the melting point of the compound and will cause so-called darkening.

Every chemist knows that a small, a minute amount of impurities will often lower the melting point of a pure compound considerably and does not conflict with the pharmacological value of that compound. I will reiterate that I am confident I can take as much as any doctor will prescribe for me, of any of those two compounds which I made. I stand here ready to consume any amount of that any doctor would prescribe—taken into my own system. In 1917 the criterion of purity——

THE COURT: Dr. Freedman, I have not interrupted you because I do not desire to prevent you making any statement that you want, but unless you have something further that you want to say specifically, then I will ask you to answer such questions as Mr. Kresel may put to you.

THE WITNESS: I was just making those statements, your Honor, to vindicate myself, in your estimation, and if you think I have——

THE COURT: No, I am perfectly willing to hear you make any statements.

THE WITNESS: Your Honor, I have not done this to make any grand stand play. I was put on trial under very severe test at a very unusual time, your Honor will realize.

THE COURT: No, I did not realize it, and I do not realize it now, Dr. Freedman, because I understood you in your testimony to say you could do it in three hours, then I understood your testimony that you could do it in six hours.

THE WITNESS: Yes, your Honor, providing all the apparatus is given to me and I can start work immediately, but I had to gather the apparatus with the aid of Dr. Alleman, and that took considerable time. In fact, took most of the time. A good part of the time was devoted to getting the apparatus and pyruvic. While I was running the other operations, I was running back and forth getting the apparatus ready for the pyruvic distillation.

THE COURT: Have you any further questions, Mr. Kresel?

MR. KRESEL: Yes, sir.

RE-CROSS-EXAMINATION.

By MR. KRESEL:

RXQ. 271. Dr. Freedman, I understood you to say in your statement that you have just made to the Court, that this variation between the first and second experiments, namely, that in the first experiment you did not simultaneously pour in the benzaldehyde and the aniline, but poured in the benzaldehyde first and the aniline second——

A. That is correct.

RXQ. 272. I understood you to say that in your

opinion and from your experience, that would make no difference in the result; is that correct?

A. In my opinion it would not.

RXQ. 273. And, indeed, I understood you to say that you did that exact same thing in the first experiment that you ever made in 1917 with the Calco Chemical Company; that is right?

A. If my recollection is correct. That is my recollection.

RXQ. 274. In other words then, the fact is that the very first experiment that you made, as to which you testified on Saturday, was made by you by first pouring in benzaldehyde and then as soon as you could the aniline; that is right?

A. Pardon me. Will you just ask me that question again?

MR. KRESEL: I will have the stenographer repeat it.

(RXQ. 274 repeated as above recorded.)

A. To my best recollection, that is so.

RXQ. 275. And therefore it follows, does it not, Dr. Freedman, that your first experiment that you made in 1917, when you were with the Calco Chemical Company, was in that respect not according to the patent?

A. Not according to my interpretation, no.

RXQ. 276. That is a matter of interpretation. You have been asking for your laboratory notes. I have them here. Now I will give you this book and ask you to state whether that is the laboratory book containing your notes?

A. This is one of them.

RXQ. 277. Is it the first one?

A. I will have to look at it.

RXQ. 278. Please.

A. This is the first one, yes.

RXQ. 279. Will you please find therein the first

experiment that you recorded, that you made in an endeavor to make cinchophen?

A. The first experiment?

RXQ. 280. What is the date?

A. The date is August, the 8th month—August 3, 1917.

RXQ. 281. And what page in the book?

A. Page 75 in the book.

RXQ. 282. All the preceding pages are in your handwriting?

A. Yes, I think so.

RXQ. 283. And they show experiments on other drugs, do they?

A. Yes.

RXQ. 284. This page 75 is all in your handwriting, is it?

A. Correct.

RXQ. 285. And does it record the steps you took in that experiment; or rather, I will put it this way; does it correctly record the steps you took in that experiment?

A. It does not record the steps at all.

RXQ. 286. On the inside cover of this book there is a typewritten statement directed to you. Do you recall that?

A. I do.

RXQ. 287. And you are requested by this typewritten statement in the following language: "Please see that the work you record is sufficiently described so that some one else may know just what is referred to." Do you remember that?

A. I remember it now, yes.

RXQ. 288. Those were your instructions from your employers, were they?

A. According to that——

RXQ. 289. Were they?

A. I can't say "yes," because Dr. Beardsley's

name is signed to that, and Dr. Beardsley was not my employer. My employer was Dr. M. S. Fine. I took orders from him. He saw my note books and saw my experiments; and as he made no objections to them, I do not see why anything is brought up.

RXQ. 290. In other words, you did not regard these instructions to be binding on you; is that your testimony?

A. Yes.

RXQ. 291. All right. I will take your testimony.

A. Wait. Let me modify that—but I was always willing to live up to all instructions of the concern.

RXQ. 292. Did you understand, Dr. Freedman, that you were required to put in this experiment book the steps that you took when you performed an experiment?

A. I always put in all the steps I take.

RXQ. 293. But in this first experiment on cinchophen you say you did not?

A. I did not, according to that.

RXQ. 294. It is that experiment, is it not, that you testified on Saturday you performed following strictly the outlines in the patent, neither adding anything nor omitting anything therefrom; and that as a result of that experiment, you got a yield of 60 per cent of the theoretical?

A. I said I did not remember correctly the yield, but I thought it was approximately 60 per cent.

RXQ. 295. And it is this experiment that I have just directed your attention to on page 75 of this book that you were testifying about, is that not right?

A. Well, I am not sure that it was that experiment. That was done about six years ago, and my memory is not so sharp.

RXQ. 296. But my dear Dr. Freedman, didn't you testify that it was the first experiment that gave you that yield?

A. I thought it was the first experiment.

RXQ. 297. Do you want to change it now?

A. No; because I don't remember.

RXQ. 298. Well, when you said it was the first experiment, didn't you know whether it was?

A. I wasn't sure.

RXQ. 299. Well, why didn't you say you were not sure? Now, let me read it to you. I read from your cross-examination, page 4604:

> "Q. And your testimony is that you started experimenting with cinchophen in the fall of 1917?
>
> "A. That is correct.
>
> "Q. And you took this patent and you followed exactly the steps that are outlined there for the manufacture of cinchophen?
>
> "A. Correct.
>
> "Q. And having followed those statements exactly, you obtained cinchophen?
>
> "A. I did.
>
> "Q. The first time that you ever attempted it?
>
> "A. That is correct."

Now, is it correct, or isn't it correct?

A. It is correct that I obtained cinchophen the first time I tried it, as recorded on page 75.

RXQ. 300. Is it correct, or isn't it correct, that the first time that you attempted it, you got a yield of approximately 60 per cent?

A. My testimony says I am not absolutely certain, but I think it was approximately 60 per cent.

RXQ. 301. Now let us turn to your page 75. What does "P. Q." stand for?

A. That was the designation given to cinchophen by the company, just to make it shorter.

RXQ. 302. This shows, does it not, that in this experiment you had 318 grams of benzaldehyde, is that right?

A. Yes, sir.

RXQ. 303. Turn to the patent. How many grams are required by the patent?

A. 96 parts by weight of benzaldehyde. I beg your pardon. 106 parts by weight. 106 times 3 is 318. I used 3 parts by weight according to these figures.

RXQ. 304. Which weight is 3 grams?

A. No, no, no. The patent says 106 parts by weight. I can take one part by weight or two or three or four, as many as I please, providing I take the same number of parts by weight of the other ingredients.

RXQ. 305. Pardon me. I simply want to understand you. You are required by the patent to take 106 parts by weight?

A. That is correct.

RXQ. 306. Your interpretation is therefore, that you can multiply that 106 by any number, provided you multiply by the same number the other ingredients and your result will be the same; is that your answer?

A. That is correct.

RXQ. 307. Tell me how much aniline the patent says you should use?

A. 93 parts by weight.

RXQ. 308. That would give you how many parts if you multiplied by three?

A. 279.

RXQ. 309. How much pyruvic acid is required?

A. 88 parts by weight.

RXQ. 310. Multiply that by three.

A. That gives 264, I think.

RXQ. 311. You then put down here under these numbers of grams a star opposite the 318 grams, which represents what, benzaldehyde?

A. Benzaldehyde, technical, from Forasynth Laboratory.

RXQ. 312. That simply shows where the benzaldehyde came from?

A. Exactly, and the date received.

RXQ. 313. Now, what is next? Read the next.

A. Yield, 323 grams crude product (50 per cent).

RXQ. 314. Of the crude?

A. Yes.

RXQ. 315. Did you ever refine the crude?

A. Some of it, yes.

RXQ. 316. Upon a yield of 50 per cent crude, how much refined product would you get, from your experience? I am testing your experience only.

A. Well, I do not remember, Mr. Kresel; I have not done it in such a long time. I can not recall what I would get.

RXQ. 317. Well, would you get more than 30 per cent of the crude in the form of final product?

A. I don't know. I can't recall what I got and I don't know what I will get.

RXQ. 318. I am not asking you what you will get. I was trying to see whether you could help me to the extent of your knowledge.

A. I will try.

RXQ. 319. Can you tell what percentage of final product you get from the crude?

A. I can not tell exactly.

RXQ. 320. Approximately?

A. To the best of my knowledge, I think it would come out that 60 per cent of crude I would get pure; about 50 to 60 per cent of that crude.

RXQ. 321. Fifty to sixty per cent of the crude you would get in refined product?

A. In refined product, not counting what would be in the mother liquors.

RXQ. 322. We were not talking of that. We are not talking about mother liquor now; let us leave that out. Fifty per cent of fifty per cent of the crude would give you 25 per cent of final refined product, would it not?

A. Yes, according to my mathematics.

RXQ. 323. Between 25 and 30 per cent, therefore, would be your final yield?

A. About that.

RXQ. 324. Doctor, how is it that in this first experiment you did not put down the steps that you took in getting your fifty per cent of the crude?

A. To tell you the truth, I don't know.

RXQ. 325. I read further from your notes the following: "Took fifty grams, extracted"—I wonder whether I am reading that correctly.

A. If you will show it to me perhaps I can help you.

RXQ. 326. Yes, read it (handing witness).

A. Took fifty grams, extracted, in 150 c.c. alcohol, filter, wash with 25 c.c. alcohol, then repeated.

RXQ. 327. In other words, you took 50 grams of what?

A. Of that crude product.

RXQ. 328. Of the 323 grams that you had obtained?

A. That is correct.

RXQ. 329. And you washed that in 150 c.c. of alcohol?

A. That is right.

RXQ. 330. What did you get?

A. What does it say there?

RXQ. 331. You read it.

A. Let me have it.

RXQ. 332. Just read it (handing witness).

A. It does not say anything yet. The next statement is: "Recrystallize from 250 c.c. alcohol."

RXQ. 333. And then finish it up.

A. "Product poor." "M. P." Meaning melting point. "204 to 205," meaning degrees, "with darkening."

RXQ. 334. So your first experiment, according to your own notes, gave you a poor product, melting point

204, and you did not put down a single step that you took to produce it; that is right, is it not?

A. That is right, sure.

RXQ. 335. And that is the experiment as to which you testified on Saturday, that you made following exactly the steps in the patent, and you got a yield of about 60 per cent., is it not?

A. I said I did not remember exactly. I thought it was that.

RXQ. 336. You thought about 60 per cent.; is that right?

A. (Witness nods his head.)

MR. KRESEL: I think that is all, Doctor. I will have to ask that this page 75 be marked in evidence.

THE COURT: It is admitted.

Received in evidence and marked "Defendant's Exhibit No. 368." (*See Exhibits, Vol. V, page 3466.*)

RE-DIRECT EXAMINATION.

By MR. ANDERSON:

RDQ. 337. When did you make those notes?

A. The date is given. August 3rd, I believe.

MR. KRESEL: August 3, 1917.

RDQ. 338. Where has that book been since that?

A. It has been in the hands of the Calco Chemical Company. It is their property.

RDQ. 339. When did you leave the Calco Chemical Company?

A. I left the Calco Chemical Company to my best knowledge and belief I believe in September, 1919.

RDQ. 340. Have you ever seen that book since that?

A. No, sir.

RDQ. 341. And I believe you said you had not made any cinchophen since 1918?

A. That is correct.

RDQ. 342. You were asked on cross-examination the other day how you happened to come here to testify. Were you requested to come here by the counsel for the Government?

A. A man by the name of Mr. Wright came up to see me.

RDQ. 343. He told you he was a representative of the Department of Justice, did he not?

A. I think so, yes. That is what I understood.

RDQ. 344. And he requested you to come here and testify, did he not?

A. Yes.

MR. ANDERSON: I would like an opportunity to examine these notes a little, if I might, sir. I called for the production of that book Saturday and today.

THE COURT: Are you through with the witness?

MR. ANDERSON: If I could examine those notes I might be through with him.

MR. KRESEL: We have no objection.

MR. ANDERSON: And let a chemist go over them. He might stand aside.

MR. KRESEL: No, we object to any chemist going over them. These are records of this company relating to their business. I do not think that is fair. I have no objection to Colonel Anderson examining them.

MR. ANDERSON: Of course, I would like to go over them with the witness, because they do not mean anything to me. They may just as well be in Sanscrit as far as I am concerned. I will have to have someone to interpret them, put them into the English language.

MR. KRESEL: I will say this to Colonel Anderson: I have no objection to Dr. Freedman going over it with him. Surely nobody can explain it better to him than Dr. Freedman. I say I have no objection to Dr. Freedman doing it, because he already knows the contents thereof; but I do not think it is proper that some other chemist should now go pawing over our records.

MR. ANDERSON: I have no objection to that, sir, but I would like Mr. Knight to run over that book and see if there are any further questions to ask Dr. Freedman. I do not know of any. If there are not, he might leave. Then I would ask in the next half hour, if your Honor would have no objection, that he might go back to New York.

THE COURT: If you are through with him, I am through with him.

MR. ANDERSON: In the second place, I wish to state now in the presence of Dr. Freedman that he is ready to return here after a reasonable time—I do not know how much time he expects to be away—and complete the work under the direction of Dr. Alleman or anybody else.

THE COURT: You may have him do that if you like. I am not interested in its completion.

THE WITNESS: May I make one more statement, your Honor?

THE COURT: Make all the statements you like.

THE WITNESS: There is one point here which I meant to state which Dr. Crossley showed you, but he did not go into an explanation about this, which I believe a very important part of it. This (indicating) shows some filter papers taken from the funnel, in which the substance was filtered.

THE COURT: Colonel Anderson, the witness is yours. I am not going to stop him.

MR. ANDERSON: I think myself we have gone

enough into those experiments, if it is satisfactory to your Honor.

THE WITNESS: I want to show a great quantity of the substance adheres to these papers, and in carrying out the reaction with very small quantities considerable is lost.

MR. ANDERSON: Those will be kept with the remainder of the stuff, will they?

THE COURT: The Marshal will take all of that and keep it locked up.

MR. ANDERSON: You may stand aside, Dr. Freedman.

THE COURT: Mr. Kresel, as I understand, you have turned this book over to Mr. Knight or Colonel Anderson, have you not?

MR. KRESEL: I have turned it over and Mr. Knight now has it in his possession. May I ask the witness another question?

THE COURT: You may.

RE-CROSS-EXAMINATION.

By MR. KRESEL:

RXQ. 345. Dr. Freedman, do you remember you testified on Saturday that you saw the cost sheets from which you learned that the cost of research on cinchophen was not anything like $60,000? Do you remember saying that?

A. I thought they were the cost sheets of cinchophen.

RXQ. 346. You thought what?

A. They were the cost sheets on that particular product.

RXQ. 347. Don't you know whether what you saw were the cost sheets on cinchophen?

A. That was my recollection.

RXQ. 348. Look at these papers. Are these the papers you refer to (handing witness)?

A. What is the—no, Mr. Kresel, these are 1919.

RXQ. 349. But look for 1917; you will find them there? Do you find them?

A. I think some of these were the papers, yes.

RXQ. 350. Very well.

A. Of course, it is just memory. I have no proof and no pictures of them.

RXQ. 351. Oh, of course, it is memory. Please look at those for 1917 and point out any place where you find a single item of research work.

A. There is laboratory expenses, $45.96.

RXQ. 352. Laboratory expense on what?

A. Under the big head of manufacturing expenses.

RXQ. 353. But I am not talking about that.

A. You said research work.

RXQ. 354. I did.

A. And laboratory work.

RXQ. 355. What?

A. Laboratory work. Yes, I agree with you, that is correct.

RXQ. 356. That is not research work, is it?

A. Yes, I agree with you. I may have seen other papers by Dr. Fine; I do not recall exactly. It was in 1917. I can not remember all those things.

RXQ. 357: Tell me, Dr. Freedman, what was it—were you trying to find out at that time what it was costing the Calco Chemical Company in its research work?

A. What do you mean, Mr. Kresel?

RXQ. 358. My quesion is perfectly simple, I think. I will put it in a different way.

A. Very well.

RXQ. 359. Just how did it come about that you were examining their cost sheets?

A. To my best recollection and belief now they were shown to me by Dr. Fine.

RXQ. 360. You were just a chemist in the laboratory there, were you not?

A. Exactly.

RXQ. 361. What was your pay at that time?

A. When?

RXQ. 362. In 1917.

A. I started with the Calco—in 1917 I believe it was $1,200 a year.

RXQ. 363. $1,200 a year?

A. That is correct.

RXQ. 364. Do you still persist in saying that the Calco Company to your knowledge did not spend $60,000 in research work on cinchophen?

MR. ANDERSON: He did not say to his knowledge, Mr. Kresel; he said to the best of his recollection and belief it was exaggerated.

A. The Calco Company may have done——

RXQ. 365. Pardon me a minute. Are you doubtful as to what you said on the subject? If you are, I will read it to you.

A. Yes, please read it.

RXQ. 366. I will read it to you. This was on direct by Colonel Anderson, at page 4600: "Q. 44. It has been testified here that the Calco Chemical Company spent $60,000 in research work on cinchophen. Can you state whether that is a fact or not?" That question was not answered, but the next question was: "Q. 45. Can you state whether they spent $60,000 in that work? A. I am pretty sure that sum is considerably exaggerated."

Now, do you still say that?

A. I think the direct research work, according to my interpretation and opinion of what research work on cinchophen was up to the time I left—I think that sum is exaggerated, yes.

MR. KRESEL: I do not think I want to ask anything more.

MR. ANDERSON: You may stand aside, and I will call Dr. Myers.

MR. KRESEL: Dr. McCoy asked me before luncheon if I would get through with him as soon as I could. Of course, I could not interrupt the other thing. May he be called now, sir?

MR. ANDERSON: That is satisfactory to me, sir.

MR. KRESEL: All right, I will call Dr. McCoy. I am sorry to have kept him waiting so long.

(Witness excused.)

GEORGE W. McCOY resumes the stand.

MR. ANDERSON: May it please the Court, the matter of the record produced by Dr. McCoy, that request was made in chambers and we requested Dr. McCoy to go back to Washington and find what records he could and bring them here by today, if possible. He did bring them up last night. If those records are to be used I am inclined to the view that they should be shown in chambers.

MR. KRESEL: If your Honor please, I have a suggestion to make which I think will obviate the difficulty of going into chambers and going through all these technical matters. I have examined some of the records during the recess hour, in the presence of Dr. McCoy, and they are perfectly plain. I mean no technical information is required to explain them. If it is agreeable to counsel I will just take one of these books—that is, the only one I am interested in—and ask that certain portions thereof be marked in evidence. That will obviate the necessity of going into chambers. I shall not read any portions.

MR. ANDERSON: The point is that they are

records of the Health Department, of the Treasury Department, and Dr. McCoy has said to me while he would be very glad to produce them, they are all he has and he did not want to leave them here. If he can take them back, I suppose you can put them in evidence.

MR. KRESEL: We can put them in evidence and copies may be supplied to the Clerk.

MR. KRESEL: I am sure, your Honor, that what I shall ask will be only about dates, so there is no reason why they cannot be given here. I am not going to ask any names.

RE-CROSS-EXAMINATION.

By MR. KRESEL:

RXQ. 109. What is the first day when the United States Public Health Service Hygienic Laboratory analyzed the first sample of arsphenamine?

THE COURT: Any objection to that?

MR. ANDERSON: No, sir. I just want it to appear of record that all of the records that Dr. McCoy was able to find of the test analyses, etc., which were called for as the basis for questions which it is claimed are hearsay, have been produced in Court, and if necessary, I am willing to go in Chambers, but I am also willing for counsel to proceed with the examination, as I am sure he will not exceed the limits imposed by your Honor; and if Dr. McCoy feels these limits are being exceeded, he has the right to stop at any time and ask the Court to say so.

THE COURT: He may say so.

MR. ANDERSON: Then I have not the slightest objection.

RXQ. 110. Just the date?

A. The first on this record is 12/12/17, December 12, 1917.

RXQ. 111. Was there a preceding record?

A. There probably were, but I have been unable to find them.

MR. KRESEL: These pages are not numbered. I offer in evidence the record under date of January 9, 1918.

RXQ. 112. Is that the correct date for this (indicating)?

MR. KRESEL: That will be what number, Mr. Clerk?

THE COURT: January 9th, from what book, Mr. Kresel, so that it might be identified?

MR. KRESEL: Book No. 7,167, entitled "Arsphenamine. U. S. Treasury Department Hygienic Laboratory."

THE COURT: Produced by Dr. McCoy, and being one of the Government records.

MR. KRESEL: That is my understanding.

THE WITNESS: Yes, sir.

MR. ANDERSON: I have no objection if it be understood that Dr. McCoy's book will not be marked, but that Dr. McCoy will supply a copy or photostat. Will you have that done?

THE WITNESS: Yes.

MR. ANDERSON: The photostat or whatever it is will occupy the position of the book, a note being made by the Clerk that it will be supplied.

MR. KRESEL: That is satisfactory.

Received in evidence and marked "Defendant's Exhibit No. 369." (*Not printed.*)

MR. KRESEL: I offer in evidence the record under date of February 1st, date received February 6th, and I ask Dr. McCoy if that is 1918?

THE WITNESS: I so assume. I have every reason to believe so.

Received in evidence and marked "Defendant's Exhibit No. 370." (*Not printed.*)

MR. KRESEL: I offer in evidence the page
der date of February 25, 1918.

Received in evidence and marked "Defe
ant's Exhibit No. 371." (*Not printed.*)

RXQ. 113. You will have photostats made, v
you?

A. Yes.

RXQ. 114. We will give you a memorandum.

A. Very well.

RXQ. 115. Is this the next one?

A. Yes, but the arsphenamine begins pretty w
back in that book.

RXQ. 116. Will you show it to me?

A. Yes, sir. (Indicating.) This begins the a
phenamine.

RXQ. 117. This is 1918, is it not?

A. I would have to go through it a little bit
find the date. Yes, this is 1918.

MR. ANDERSON: May I ask this question
Dr. McCoy?

By MR. ANDERSON:

RDQ. 118. Dr. McCoy, are these records pub
records for the information of the public?

A. I would say not; but I do not pretend to be
expert. They are confidential records of the labo
tory.

MR. ANDERSON: In those circumstances,
would ask that the copies of these records be
cluded in the records taken in Chambers, with
appropriate notation on this record that they
so included as exhibits. Being uninformed mys
as to their status, I want to make no mistake.

THE COURT: I was under the impression th
they were being so offered.

MR. ANDERSON: Because they involve mea
etc., which I think might have to be kept secret.

MR. KRESEL: Yes, that is all right.

MR. ANDERSON: And be taken subject to the conditions imposed as to the evidence in Chambers.

THE COURT: Yes.

MR. KRESEL: I offer in evidence the record on page 106 of this book, which is entitled "Arsphenamine, G. C. Lake, Hygienic Laboratory," found at page 106 under date of February 9th, and March 1st, also March 2nd; also page 107; also the matter on page 108 under date of February 23rd and March 5th, 1918; on page 116, under date of March 21st and March 20th; and on page 122, under date April 2nd, 1918.

Received in evidence and marked "Defendant's Exhibit No. 372." (*Not printed.*)

THE COURT: Mr. Mahaffy, you understand that those exhibits when received are not to be put with the public records, but with the private records.

THE CLERK: Yes, sir.

MR. KRESEL: I think that is all.

MR. ANDERSON: I desire to offer in evidence the additional pages of the book first referred to as Nos. 7167, beginning with the first page, on which the data is kept, headed "Tests made 12/20/17" and going down to the page beginning with the heading "2/25" under the date line, exclusive of the pages which have been offered by the defendant, to the end that the record may be complete, and subject to the same conditions therein imposed, and the same right to reserve the book and substitute copies.

By MR. ANDERSON:

RDQ. 119. Dr. McCoy, you will give me copies of them, and I will send them to the Clerk?

A. Yes, sir.

Papers offered by Mr. Anderson received in

evidence and marked "Plaintiff's Exhibit No. 682." (*Not printed.*)

MR. ANDERSON: I now offer in evidence all the pages of the book entitled "Arsphenamine, G. C. Lake," referred to by counsel for the defendant, beginning at page 106, down to and including page 196, with the exclusion of those pages put in evidence by the defendant.

THE COURT: Are they all pertinent, in your opinion? Have you gone over them?

MR. ANDERSON: Yes, sir, I have been over them, and I think if any go in, we ought to have the complete record of these tests. I think they are very important, sir.

THE COURT: Anything to say, Mr. Kresel?

MR. KRESEL: That is going to make a tremendous record, your Honor.

MR. ANDERSON: I am very sorry, sir. I do not think any of it has anything to do with the case; but if any of it goes in, I think the record ought to be complete.

THE WITNESS: May I say something, your Honor?

THE COURT: Yes.

THE WITNESS: Those pages contain a lot of data of a purely experimental nature, which has nothing to do with the acceptance or rejection of the product, and unless interpreted by someone thoroughly familiar with them, might lead to some serious errors.

MR. KRESEL: Col. Anderson has said he examined it all and he knows what he wants.

By MR. ANDERSON:

RDQ. 120. Does that apply to all the pages of this book?

A. That applies to much of the book. I am not prepared to say now just what pages might be an exception to that; but a great deal of all of these records

--experimental and routine testings, were put down in chronological order.

RDQ. 121. As a matter of fact, no arsphenamine was allowed to be sent out to be sold, unless it passed these tests, was it?

MR. KRESEL: May I make a suggestion which I think will solve this and give the Government what I think it wants. If we may step up to the bench, I will make the suggestion.

(Counsel confer wih Court at the bench.)

MR. ANDERSON: Since the conference between the Court and counsel off the record, in order to shorten the record, I will ask that by consent of the parties Dr. McCoy be allowed to take the two books which have been presented here and have copies made or photostats made as may be convenient, of all those parts which relate to the tests of salvarsan or neosalvarsan made by the Public Health Service for the period covered by the pages of these books which I have indicated.

MR. KRESEL: What is the last date?

MR. ANDERSON: The last date will be September 21, 1918, in this book.

MR. KRESEL: I think that in order to make the record complete, you had better carry it down, if you will, Dr. McCoy. I see you have another book here.

THE WITNESS: I have two more here.

MR. KRESEL: Carry it down to say the end of 1918.

MR. ANDERSON: I would want to carry it even further than that .

MR. KRESEL: You want it further?

MR. ANDERSON: I do.

MR. KRESEL: How much further?

MR. ANDERSON: I should say certainly up to the end of 1919.

MR. KRESEL: All right.

RDQ. 122. Would that be a fair exposition of the experience, Dr. McCoy?

A. It would be fair enough, but it is a big job for somebody.

RDQ. 123. Well, so long as we are in it, we have got to do it.

A. It would be a month's work to go over these records, sir, and call out the pertinent data and exclude the experimental.

MR. KRESEL: Do it as best you can and as soon as you can.

RDQ. 124. I am sorry, Doctor, but in view of the fact that some of it is going in, I think that it is due to the Government and due to the parties concerned, the individuals and manufacturers concerned, that the data should be complete; and therefore I will have to ask that you do it if you can.

A. Excluding the experimental?

RDQ. 125. Excluding the purely experimental; but all notes of tests; and if you find it necessary, in order to make it clear, to put an explanatory note on to any item, you will please do so, and when you make copies, make three copies, if possible, that I may submit one to Mr. Kresel, have one for myself, and one for the Clerk.

MR. KRESEL: The explanatory notes, I understand, are to be simply to where Dr. McCoy is in doubt as to whether the entry is an experiment or a test.

MR. ANDERSON: Where the entry standing alone would not tell the truth, I should think. That applies to books 1 and 2. Now, Dr. McCoy, have you got the book covering up to the end of 1919?

THE WITNESS: June 30, 1919.

MR. ANDERSON: That will be late enough.

MR. KRESEL: All right, that satisfies me, June 30, 1919.

MR. ANDERSON: The request includes the data in your records up to June 30, 1919?

RDQ. 126. Will you have that done, Doctor?

A. Yes, sir.

MR. ANDERSON: Then the papers will be filed at a later date, I think.

Received in evidence as "Plaintiff's Exhibit No. 683" (to be supplied). (*Not printed.*)

MR. ANDERSON: If that is all, Dr. McCoy may stand aside.

MR. KRESEL: That is all.

(Witness excused.)

MR. KRESEL: Would you like me to finish with Dr. Gibbs?

MR. ANDERSON: If you have any further questions to ask of Dr. Gibbs, I would be glad if you would.

MR. KRESEL: I have two questions I desire to put to Dr. Gibbs.

RE-CROSS-EXAMINATION.

By MR. KRESEL:

RXQ. 192. Dr. Gibbs, have you had any experience in chemistry work in relation to the dye industry?

A. I have.

RXQ. 193. How long has that experience continued?

A. Approximately seven years.

MR. ANDERSON: I would like to give notice that this is outside of the direct, and if counsel takes this question up, he will be his own witness.

MR. KRESEL: I have finished. That is all I wanted to know. That is all, Dr. Gibbs.

RE-DIRECT EXAMINATION.

By MR. ANDERSON:

RDQ. 194. Where did you have that experience?

A. I was chemist in charge of the color laboratory of the Bureau of Chemistry and I was an employee of the DuPont Company.

RDQ. 195. Did you want to make some explanatory statement?

A. If your Honor please, there is a mistake in my testimony of last Saturday. I would like to correct it, if I may.

RDQ. 196. Yes, you may make the correction.

A. It is not extremely material, but I would like to have it accurate, if I may have page 4669.

RDQ. 197. All right, Doctor.

A. On the fifth line: "THE WITNESS: I have helped to draw a great many patent specifications."

I did not say that. I said I have taken out a great many patents. Then the last word of the same sentence should be "rest" instead of "work." I said, "I tell an attorney what I have discovered and he does the rest." I did not say "work."

RDQ. 198. "I have taken out a great many patents," did you say?

A. Yes.

MR. ANDERSON: May I make the change in the record, sir?

RE-CROSS-EXAMINATION.

By MR. KRESEL:

RXQ. 199. Dr. Gibbs, have you been able to fix the date of your conversation with Mr. Garvan any better than you could do it last Saturday?

A. Are you referring to my first conversation with him?

RXQ. 200. I am referring to the conversation at

which you told him that salvarsan had been made in your laboratory?

A. No, sir.

RXQ. 201. You have not been able to?

A. No, sir. I have been very busy since then and I have not thought of the matter. I might state, if you desire it, that I have been able to fix more accurately the date of my first conversation with him, the first time I met Mr. Garvan.

RXQ. 202. I have no objection to your stating it.

A. Not that it is material at all, but I stated, I think, sometime in October, and I ran across a reference to something that leads me to believe that my first acquaintance with him occurred about two months earlier, in August. It is perfectly immaterial, but I want to be as accurate as possible.

RXQ. 203. And do you still say that you did not have any conference with him after April 10th, 1919?

A. I am just as certain of that now as when I made the statement.

RXQ. 204. You are, sir?

A. Nothing has occurred to change my opinion in any way.

MR. ANDERSON: Dr. Gibbs, as the record discloses, has been engaged on other duties since Saturday. I intended for him to go to Washington and look at his notes and memoranda on this matter, but it has been impossible. I would therefore ask if there is any question about it, that he go to Washington and at some later day, in some of the proceedings here, to verify his statement or produce the contemporaneous memoranda to support the same if he can find it.

MR. KRESEL: I do not want to be a party to keeping this case open for any such purpose.

THE COURT: He may send to you if you desire, with the consent of Colonel Anderson, such

memoranda as he may find, and then if you deem it of any particular importance, possibly on the date of the argument there may be a stipulation entered.

MR. ANDERSON: We shall be very glad to do that and I shall ask Dr. Gibbs to get any data he has to support that date. I want to fix that date. You can stand aside, Doctor.

(Witness excused.)

MR. ANDERSON: Now, Dr. Myers, I will call you to the stand.

CHESTER N. MYERS.

CHESTER N. MYERS was called as a witness in rebuttal on behalf of the plaintiffs, and having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. ANDERSON:

Q. 1. Please state your name and place of residence—

MR. KRESEL: Colonel Anderson, do you desire anything more from the Calco Chemical people about their figures? They are here and very anxious to get away.

MR. ANDERSON: I should like to have a chance to examine their figures as to cost, or somebody else might do it. Mr. Galloway might do it or somebody.

MR. KRESEL: Suppose you put Mr. Galloway in touch with them.

MR. ANDERSON: Will you take that up, Mr. Galloway, and see what the cost was.

Q. 2. Please state your name and place of residence?

A. Chester N. Myers, 34 Cedar Place, Yonkers, New York.

Q. 3. What is your profession?

A. Essentially a chemist.

Q. 4. Where were you educated?

A. I was educated at Williams College, Williamstown, Massachusetts, and Johns Hopkins University, Baltimore, Maryland.

Q. 5. What degrees, if any, have you?

A. I received the degree of Bachelor of Arts at Williams College in 1906, and the degree of Doctor of Philosophy of Johns Hopkins University, in June, 1910.

Q. 6. What has been your general experience in your profession?

A. I was Fellow by courtesy of Johns Hopkins University; University Scholar of Johns Hopkins University, and Carnegie Assistant for the Carnegie Institution for the Advancement of Science assigned to Johns Hopkins University; Associate in the Carnegie Institution for the advancement of science at Johns Hopkins University; Assistant in Johns Hopkins University Graduate School, Department of Chemistry; Associate in the Graduate Department of Chemistry, Johns Hopkins University; Director of Research for the Texas Oil Company, during the summer periods in that interval; Associated with the United States Government as Technical Assistant, Organic Chemist, and in the last few months rated as Associate Pharmacologist.

Q. 7. Where are you now employed?

A. Employed at the H. A. Metz Laboratories, 122 Hudson Street, New York City.

Q. 8. Are you here to testify by request of the Government in this case?

A. I am.

Q. 9. How long were you in the service of the United States, in the Public Health Service?

A. From the beginning of 1914 until March, 1919.

Q. 10. During your connection with the Public Health Service, did you ever undertake to make, or make, arsphenamine or salvarsan or any of its derivatives?

A. I did.

Q. 11. In what year?

A. I began my first work with the arsphenicals in 1915. The work directly with the preparation of salvarsan and its derivatives was in 1918.

Q. 12. You were then connected with the Public Health Service?

A. I was.

Q. 13. When did you leave that Service, Dr. Myers?

A. The early part of March, 1919.

MR. ANDERSON: Will you let me see the Federal Trade Commission license for salvarsan.

Q. 14. Dr. Myers, are you familiar with the patents granted by the United States in relation to salvarsan or arsphenamine and its accompanying remedies?

A. I am.

Q. 15. Did you become familiar with that subject while an officer of the Public Health Service?

A. I did.

Q. 16. Can you state how many of those patents there are, so far as you know?

A. No, I could not.

Q. 17. Well, I will ask you to take, first, the patent 986,148 granted March 7, 1911, that is in evidence as Defendant's Exhibit No. 156. Are you familiar with that patent?

A. I think I am.

Q. 18. Have you ever undertaken yourself, personally, to make arsphenamine, or salvarsan?

A. I have.

Q. 19. When did you undertake to do this?

A. In 1918.

Q. 20. While you were still connected with the Public Health Service?

A. I was.

Q. 20A. Take the patent which I have just handed you; follow down the steps named therein, stating where you started?

MR. KRESEL: Will you please ask him to fix the date. He said in 1918.

MR. ANDERSON: I will start the question again.

Q. 21. Fix the date as nearly as you can, Dr. Myers, when you began the work or experiments in making salvarsan, and if you can do so, approximately when you stopped the work, the personal work of making salvarsan; that is, I want to get the dates of your work approximately as near as you can now remember.

A. May I ask you a question?

Q. 22. Yes.

A. Just what do you mean by making salvarsan —intermediates or—

Q. 23. Experimental work.

MR. KRESEL: Wait a minute, please. He was answering the question. He had not finished.

THE WITNESS: What do you regard as the starting point of making salvarsan?

MR. ANDERSON: I do not think anybody knows, but I would say that possibly when you began to experiment in connection with the German patents is what I am coming to.

THE WITNESS: As soon as the product was licensed in the United States, because for this reason—

MR. KRESEL: One minute, please, you were

asked to fix a date. Fix a date as nearly as you can.

THE WITNESS: I think the requirements for the manufacture and production of the drug was issued by the Federal Trade Commission.

MR. KRESEL: Can you fix the date?

THE WITNESS: I can not, to a decisive day.

MR. KRESEL: All right.

Q. 24. Did you do this work under the direction of the Public Health Service?

MR. KRESEL: Please do not lead him.

A. I did.

Q. 25. Now, state how you came to do that; that is, under what instructions you did it, from what source, and about when you started?

A. At the direction of the Assistant Surgeon General of the United States Public Health Service, a Division of Scientific Research has extended through the Director of the Hygienic Laboratory and the Chief of the Division of Pharmacology.

Q. 26. Where did you carry on your experiments?

A. Partly at the Hygienic Laboratory and partly in Brooklyn.

Q. 27. Where in Brooklyn?

A. The H. A. Metz Laboratories.

Q. 28. State whether or not you were ordered there by the Public Health Service?

A. I received final orders from the Surgeon-General of the United States Public Health Service, which passed through the Director of the Hygienic Laboratory, directing me to undertake research at the Metz Laboratories.

MR. KRESEL: If that is in writing, I would like to see it.

Q. 29. Have you that order?

A. I have not.

Q. 30. You went there under those orders, did you?

A. I did.

Q. 31. Will you take the patent which you have in your hand first and state what you did in the experiment to make salvarsan under that patent?

A. Having obtained this patent, I proceeded to read it over with care and after having read it over with care, I referred to the original literature which was available at that time for carrying out processes of this nature. At that point, I carried out the procedure as illustrated in line 35 of this patent No. 986,148, in which a sodium salt of para-oxyphenylarsinate, which was anhydrous, was introduced in small portions into concentrated sulphuric acid at zero degrees Centigrade, with continuous stirring; and into this mass—

MR. KRESEL: Let the record show that he is reading from the patent.

A. (Laying aside patent)—and into this mass I ran a mixture of nitric and sulphuric acid in equal proportions, thereby nitrating the mixture, forming what is known as a mononitroparahydroxyphenylarsinic acid. This product was then poured in cold water and the nitrooxyphenylarsinic acid was precipitated out as a yellow powder. This yellow powder was filtered and washed, recrystallized and dried. The product was then one which is known as a mother substance of salvarsan or 606 in the Ehrlich terminology. The reduction process as described by this patent is carried out in the following manner.

MR. KRESEL: I object to what the patent says. It is what you did. That is the question.

MR. ANDERSON: You may go ahead, Doctor, and answer what you did.

THE COURT: Did you make an objection, Mr. Kresel?

MR. KRESEL: No, your Honor, he is taking my suggestion.

A. (continuing) I dissolved the nitrooxyphenylarsinic acid in the warm water and added to it sufficient alkali to convert it into the sodium salt and used a temperature of about 50 degrees Centigrade. Sodium hydrosulphite which is the substance used for reducing pentavalent arsenic preparations of this type to the corresponding equivalent of arseno base.

MR. KRESEL: I object to all that. It is not a question of what is usual. It is what the witness did.

A.: (Continuing)—was dissolved in water at approximately zero degrees Centigrade. A warm solution of nitrooxy was poured into the cold solution of sodium hydrosulphite with continued and vigorous stirring. The container in which the mixture was placed was surrounded by a water jacket so that the temperature might be increased at a gradual increase of temperature. The temperature at which a precipitate known as arseno base came out of solution was about 30 degrees Centigrade. The reduction was continued until a temperature ranging between 50 and 55 degrees was attained. After allowing the reduction to continue for a period of about one hour and a half, the solution and suspension were allowed to stand, thereby allowing the reduced product known as arseno base to collect at the bottom of the container.

The super-natant liquid was then withdrawn by means of a siphon. The precipitate was then collected upon a filter and protected by means of carbondioxide, using vacuum for the separation of the solid and the liquid. This material was washed with cold distilled water until no acid reaction was obtained.

When the base had been thoroughly separated from the chemically held liquid, it was suspended in methyl alcohol and treated with hydrochloric acid in

methyl-alcoholic solution, thereby producing what is known as a dihydrochlorid of dioxydiaminoarsenobenzene.

THE COURT: We will now take a recess until seven o'clock standard time. Is Dr. Bolton going to be here this evening? I wanted to ask him one question before this case closed.

MR. KRESEL: Yes, sir. I shall see that he is here, your Honor.

THE COURT: Dr. Bolton was up all last night and I do not want to keep him up this evening.

MR. ANDERSON: It is quite agreeable to me to interrupt the proceeding right now and call Dr. Bolton.

ELMER K. BOLTON recalled by the Court.

By THE COURT:

Q. 572. Dr. Bolton, I think in answer to a question by Col. Anderson you testified you considered it necessary or that a chemist would always use a pure intermediate in the making of an ultimate product. Have I stated that correctly; do I bring to your mind the matter which you testified in that particular?

A. Yes. I would like to state, however, that the question of purity in organic chemistry is a term that might require a little elucidation. We do not have in our business products that are absolutely pure. There is not in the commercial manufacture of these products an absolute purity. It is a purity which can be reached by commercially practicable processes. For example we use anthracene. I do not think that the anthracene is more than 92 or 93 per cent pure. It is possible to get anthracene almost 100 per cent pure, but the amount of money which is necessary to carry

the purification to such a point is so large that the cost is almost prohibitive.

Q. 573. Then what you meant was that you used commercially—

A. Commercially pure, yes,—a commercial interpretation of that word.

Q. 574. The specific thing that I had in mind to ask you was this: The patent of which you spoke at that time, as I recall it, specified the steps for making an acid. Then the patent, as I recall it, immediately proceeds to say "this acid." I may be asking you something that will fall to my lot eventually in the determination of this case, but I am wondering whether to you, as a practical chemist, where the steps in making the particular acid have been specified, you would feel there was implied therein the necessary steps for purification. Before you answer that I will turn to the patent.

THE COURT: Have counsel a copy of it?

MR. KRESEL: Does your Honor mean the salvarsan patent?

THE COURT: Yes.

MR. KRESEL: We have.

Q. 573. (continued) Ending there (indicating). Read that and tell me (handing witness patent).

A. In answering this question I can only go back to certain experience that we have with this class of bodies, or at least try to draw something from past experience which would lead to an interpretation of what should be done. As a general rule we do not purify products, that is by crystallization, after nitration processes; we give them a washing under certain conditions. But as for a crystallization from a solvent, I do not believe that I would have that clearly in mind until after I tried the other possibilities. Because the methods which we use for the purification of such products cost less for the solvents and also for

labor, require less time, putting a product into a solution and in some cases giving it a filtration before the crystallization of the product. It depends entirely upon the character of the products which you get as by-products, and I do not know whether you can formulate really a general rule as to what should be done in such a case.

Q. 574. It occurred to me that possibly if the patent or the directions mention the use of the particular acid, you as a practical chemist, one skilled in the art, might or might not interpret that to mean a pure acid; but I was wondering whether the skilled chemist would consider that purification was implied, where the steps in making the intermediate are set out, and then the patent saying "this acid."

A. Well, in drawing on past experience you have here, as I understand it, the nitration of a product which contains the hydroxl group, that is the hydroxyphenylarsinate. The nitration of hydroxy bodies—I do not know anything about this particular one, but I do know of a number of cases where the nitration gives you oxidation products. That is, I would not expect in the nitration of a body with a group exposed like the hydroxyl group, to get a clear, clean-cut product without doing something to it.

THE COURT: My inquiry, which is one really that I have to pass on possibly from a legal standpoint, was whether the steps in producing a specific intermediate being set forth, and then the patent immediately saying something with respect to this intermediate, a person skilled in the art would interpolate in there a purification step. It is a question I will have to answer from the legal standpoint if necessary, but I was wondering whether you could give me any views you might have from the practical side of it, and I think you have given me such information as will be

of assistance to me. Do you want to ask Dr. Bolton any questions with respect to this?

MR. ANDERSON: Yes, I would like to ask Dr. Bolton a question.

RE-CROSS-EXAMINATION.

By MR. ANDERSON:

RXQ. 575. Dr. Bolton, if you were making a product derived from this intermediate which you have spoken of here as capable of oxidation, to be injected into the veins of a human being, as an arsenic product, which is highly poisonous, would you not either use pure intermediates, or purify at the proper stages those intermediates?

A. I do not believe that I would overlook the necessity of looking into a problem like that. Of course, I think that is done in almost any process, whether it is a dye or a product like this.

Now, you have in certain cases, the case that came up in my testimony, where we were talking about indanthrene blue. Indanthrene blue is a very important product. It was the most important one of the indanthrene series; and the first patent that came out covered the fusion. It was principally indanthrene blue mixed with by-products. The product claims, as they stood, were sufficient to protect that product for all time. Nobody could go ahead and manufacture indanthrene blue without infringing that patent. But after that time, they came through, they knew how to purify the product, and they brought out another patent covering the purification of the product, and covered that as a new article of manufacture.

RXQ. 576. In the case of a drug of highly poisonous character to be injected into the veins of a human being, would not the highest degree of care with respect to purity be expected, and be exercised by a chemist or person skilled in the art?

MR. KRESEL: I do not think that that is a matter for the witness to answer.

MR. ANDERSON: You have started there. Let us get this thing done.

A. Well, it is certainly a problem that a chemist has got to look into. I cannot answer that from any previous experience that I have had, because my experience is foreign to this field.

RXQ. 577. With this particular kind of compound, unless you took great precautions, you would expect impurities in by-products, would you not?

MR. KRESEL: Which compound?

RXQ. 577. (continued) Used in this patent which you have described. You said that just now, I thought.

A. If you refer to the para-oxyphenylarsinate which you introduce into sulphuric acid and then nitrate, whether you would carry it through a purification or not, would depend entirely upon your ability to identify your by-products. If you find that you have produced a product which is impure, and you can identify it as being impure, I believe that in my own experience I would try to purify the product to raise the purity. I do not know anything at all about the difficulties of such products. You do have impurities that show almost the same chemical behavior as the main product of the reaction. It depends upon the ease of identifying such impurities.

THE COURT: But how would I know, if a chemist, when reading that patent, that the first intermediate called for was not the product obtained from following those steps, but the product obtained after purification by some well known means, if such means there were? Do you see my difficulty or not? That is, if, when reading a patent of that kind, it specifies the steps for making an intermediate, then it specifies what use you shall make of this intermediate. The difficulty I

have had in thinking over the construction to put upon this patent is how would I know that in this particular instance the product identified by the patent, and not a purification thereof, would be called for?

I am wondering what there is in the art, if there is anything in the art, which would enable me to know that I should not stop where the patent stops, I should not use the product which those steps produce, but should take other steps to obtain that product before carrying out the subsequent steps mentioned in the patent.

I do not know of anything at the moment in law which would tell me to do that, and consequently, I have got to get my information from the chemist in order to enable me to do that, if I must do it in the eventual determination of the case.

MR. KRESEL: May I ask the witness a question?

By MR. KRESEL:

RDQ. 578. Dr. Bolton, as the Court has pointed out, assuming that this intermediate of this salvarsan patent would ordinarily be a toxic intermediate and if not purified at that point, would, if subsequently used, produce a very toxic drug. As I understand, the Court's difficulty is this: Does it necessarily follow that every man skilled in the art would know that he would have to purify it if the patent did not tell him so—that he had to purify it at that point?

MR. ANDERSON: I object.

THE COURT: No, that is not my difficulty, Mr. Kresel.

MR. ANDERSON: I object on the ground that this is purely a legal and argumentative question. Dr. Bolton has testified on this subject three times.

I certainly do not object to your Honor asking any person any question.

THE COURT: My difficulty is this, Colonel Anderson: If I should take that salvarsan patent and attempt to interpret it purely from the books and what little I know about patents from the legal standpoint, I should not interpolate therein any purification step. I should not do it in this patent. If the patent had said merely use this acid and named the acid, I would not have much difficulty in interpreting that as meaning the pure acid; but then I find in considering the matter that I do have difficulty when the patent specifies how to make this particular acid.

MR. KRESEL: And says nothing about purifying.

THE COURT: And says nothing about purification, and then in the very next word says—what is this word, Dr. Bolton? Will you read it there? I think it is on line 47 or line 49.

THE WITNESS: This nitro-oxyphenylarsinic acid.

THE COURT: This acid—not this acid or acid of this name when purified, but this acid. So it seems to me that I would need more help at that point than I have had so far to enable me to put in there a purification step.

MR. ANDERSON: If your Honor please, of course, I do not want to argue with your Honor on the question of construction at this time; but I do wish to call your attention to this fact: Every witness, practically, who has testified here, has said that that acid is practically the starting point in this patent—the preceding steps—you can get that acid. If you cannot, you can make it that way. They have all testified that when you have made the salvarsan at the end of the process, it

is not a drug that can be purified. It is going into the veins of a human being. It can be purified at that point or it can be purified at subsequent steps, according to the testimony, but not when it is finally produced.

That being the case, the sole question, as I take it, that Dr. Bolton could answer as an expert, which I concede he is, would not be what he would do under this patent, unless he had tried it, but whether a man who was going to make a product that would go into the veins of a human being, as highly poisonous as arsenic compounds, would not either start with pure drugs which would keep a condition of purity, or purify it at such stages as chemistry indicated.

THE COURT: My difficulty was this: I can assume that you want as low a degree of toxicity in your ultimate product as you can get. How to get it is another problem; but my difficulty, I find, in reading over that patent, is whether this particular patent does not tell me to use the product of those steps and that acid, and not a purified acid. Unless you have some other questions on this to ask Dr. Bolton, I have none.

MR. ANDERSON: I will put to Dr. Bolton the straight question whether he, as a scientist, will say that if a man was making a drug of a dangerous or poisonous character like an arsenic compound, to put into the veins of a human being, he would or would not, either start with pure drugs or purify at all stages necessary to get the lowest degree of toxicity as a prudent chemist.

MR. KRESEL: I must object to that, your Honor. That is a purely hypothetical question.

MR ANDERSON: I put it as a hypothetical question.

MR. KRESEL: Some chemists might do one

thing and some chemists might do another thing. I do not believe it is going to be helpful to have an answer to that.

THE COURT: I think I have gotten you all into trouble by my question; but I had some difficulty there as a legal problem, and it seemed to me it was a practical problem, as I said, from the standpoint of the ultimate product. I can see that there would not be injected or used a product high in toxicity, without danger of death from poisoning probably; but that is not the specific problem which is confronting me. I thought probably Dr. Bolton could help me out, but I do not believe he can further than he has. I will take his answer to your question, if you want it, but that will not help me.

MR. ANDERSON: Regardless of whether it helps your Honor or not, I would like to test what Dr. Bolton would say to that proposition.

THE COURT: You can make such other assumptions in answering that question, if you cannot answer it on these assumptions, as you want to, Dr. Bolton.

THE WITNESS: Colonel, it all depends upon whether you know that a thing is pure or not. I would start out without any experience on this class of bodies, and I would work on it, and I would get a final product. I know nothing about the physical constants of this particular product.

Now, none of these reactions in organic chemistry are so clean-cut that when the reaction is over you can say "here is the pure product, here is the one thing, and here are the impurities," and this expression is very simple, but you might have impurities present which would escape your observation for a very long period of time, and it would be only by the accumulated experience with

that body and testing it with the different reactions, getting better acquaintance with its character, that you would begin to find that it was not quite pure.

We have that duplicated time and time again in new products. We get to a point from time to time where we think that an intermediate is pure, and we do not have it pure. We go still beyond that point, but that is an accumulative experience. It is something that you cannot say what the man is going to do without any experience a priori in this particular line.

By Mr. Anderson:

RXQ. 579. Now, Dr. Bolton, would he sell that stuff and put it into the veins of a human being until he had satisfied himself it was pure?

A. He does to the best of his ability, I should think.

The Court: That is another matter. Recess until 7 o'clock standard time.

(Recess.)

After Recess.

8 o'clock P. M.

Mr. Kresel: If your Honor please, before he resumes his testimony, I desire whether it is your Honor's wish to hear argument on which counsel gave me notice.

Mr. Anderson: I have not made it yet. I may not make it.

Mr. Kresel: Notice was given to me.

Mr. Anderson: I handed counsel a copy so that in the event that I did make a motion there would be no question but what he would have a chance to examine it. But I have not made the motion.

Dr. Myers, will you take the stand, please.

CHESTER N. MYERS resumed the witness stand.

DIRECT EXAMINATION (Continued).

By MR. ANDERSON:

Q. 32. Dr. Myers, in the year 1918, at which time you said you produced salvarsan by your own experiments, had you taken occasion to familiarize yourself with existing literature on the subject which had been published prior to that date?

A. I did.

Q. 33. Can you state or refer to some of the leading literature on that subject which had been published prior to the summer of 1918 at which time you spoke of doing this work?

A. There were three main sources of literature available at that time. One was in English, the handbook of arsenical combinations by Bertheim. The second was a publication on the chemical theory of the Chemotherapy of Spirillosis, by P. Ehrlich and S. Hata.

Q. 34. Can you state the date of the publication about? If you haven't it there, I can give you a bibliography to refresh your memory.

A. I can give it to you exactly, if you care for it. The experimental Chemotherapy of Spirillosis was published in London in 1911. The exact title of the book in German was Handbuch der Organischen Arsenerbindungen, published at Stuttgart, 1913. The other sources of literature available at that time were found in the volumes of the Berichter, from Volume 40, which I think was 1907, to Volume 45, which is 1912; and the specific reference in the last one was page 756.

Q. 35. 756 of what book?

A. The Berichte Deutsche Chemische Gesellschaft, Volume 45, Page 756.

Q. 36. You spoke of sources of information. I would be glad if you would state and put into the record, the publications, with the date of publication which had come out prior to 1918, with which you were then familiar, if you have the bibliography available?

A. All abbreviated matters, you will find them on page 354 of this little booklet here.

Q. 37. Will you state what it is, because that does not mean anything?

A. This booklet here was published in 1918. These references are all previous.

Q. 38. What is the name of the book, by whom, give the title?

A. "Organic Compounds of Arsenic and Antimony," by Gilbert T. Morgan.

Q. 39. Where was it published and when?

A. Published by Longmans Green & Co., 39 Paternoster Row, London, New York, Bombay and Calcutta, 1918. This book refers to the references which are dated previously.

Q. 40. Now, as you are familiar with the patent, which you have examined before adjournment, I will ask you what steps did you take from the beginning to the end, in making the intermediates and the final product of arsphenamine in accordance with patent No. 986,148, dated March 7, 1911, and will ask you to point out from the patent each step where you derived the same from the patent or the literature, available up to April 10, 1919. Are you clear now what I mean?

MR. KRESEL: I object to the question. I object to it upon the ground that it is leading, and further that it assumes that the witness followed the patent, which the witness has not said yet. I object upon the ground that it is cumulative, and the witness has already answered the question fully as to what he did. It will be found on page 4814, and goes on for two pages thereafter.

MR. ANDERSON: Your Honor, I wish the witness would take the patent and point out in the patent the sources of his authority in connection with the literature with which he said he is familiar, for each of the steps which he testified he took from the patent.

MR. KRESEL: The witness has not said that he followed the patent at all.

MR. ANDERSON: I want him to state that now, if your Honor please. I want him to state what he did, and what sources of information there were in the patent for what he did.

THE COURT: Then you object to the question as amended?

MR. KRESEL: I do not understand it as amended. I would suggest that Col. Anderson reframe his question.

THE COURT: Will you re-frame it. I think the question as raised was not leading, but I think the objection is well taken.

Q. 41. Then I will ask you to take this patent and point out to the Court the steps which you took, and the sources of the information on which you based those steps, taken in connection with the literature with which you were familiar at that time?

MR. KRESEL: I object to the question again on the ground that it assumes that this witness followed the patent. I again say that this witness has not been asked and he has not answered that he followed the patent in the slightest.

THE COURT: I think the objection is well taken.

Q. 42. I will ask you to state whether or not you followed the processes outlined in that patent in making salvarsan in 1918 as you described?

A. I followed the process described in that pat-

ent, with the interpretations which seemed wise to me as one who is familiar with arsenicals.

Q. 43. Then I will ask you now to take the patent and follow through the steps that you took, pointing to the patent to indicate the sources from which you took them, upon what information derived from the patents you acted, and your interpretation thereof as you indicated?

Mr. Kresel: Again I object on the ground that the witness has not indicated to what degree, if any, he followed this patent.

He would say yes or no. I do not see why any distinction is made with this witness unless such be the fact, that he did not follow it.

Mr. Anderson: My reason was, sir, that I think the question "Did you follow the patent" is a conclusion, and I was trying to avoid getting into the complication which I apparently got into. I have asked the witness whether he followed the patent. He said he followed the patent with the interpretation which his experience with arsenicals as a chemist indicated. Now I want him to show just exactly what he did follow, what the sources of his information were and fit his acts to the patent. I am trying to put that question the best I can under the circumstances without asking him for a conclusion.

Mr. Kresel: I shall not object to the conclusion. What I am interested in, your Honor, is this, and I am entitled to get it now—whether this witness did or did not follow the patent exactly. He may have added certain things, but what I want to know is did he follow the patent?

Mr. Anderson: I think when he has answered the question I have asked, it will appear whether he followed the patent with his interpretations thereon.

THE COURT: As I understand your question, you are asking the witness what he did in making arsphenamine, and to point out either from the patent or from the literature of the period, the justification for each of the steps.

MR. ANDERSON: That is what I am trying to get at, sir.

THE COURT: Is there any objection to the question as so interpreted?

MR. KRESEL: Not as interpreted that way, your Honor.

THE COURT: Do you understand the question?

THE WITNESS: I think I do; yes, sir.

THE COURT: Very well; answer it.

MR. ANDERSON: The patent is No. 986,148, of March 7, 1911.

A. Patent No. 986,148 deals specifically with—

MR. KRESEL: One minute.

THE COURT: That is not the question.

MR. KRESEL: We are sitting at night here, and we do not want to waste time.

THE COURT: Strike out the answer. Tell what you did in making arsphenamine in 1918?

THE WITNESS: All right, sir.

THE COURT: And the authority for each of the steps that you took.

A. In 1918 I prepared nitro-oxyphenylarsinic acid as described in lines 33 to 50 inclusively. I likewise prepared nitro-oxy by means which are described in the Berichte of the German Chemical Society, arriving at, in each instance, products which were identical in nature. The products were crystallized for the—

MR. KRESEL: When you say "products," will you tell what product you are talking about?

A. (continued) The nitro-oxy prepared by each method was re-crystallized as a result of having read an article I—

MR. KRESEL: I object to that, your Honor. If there is any article to go in, I want to see it.

Q. 44. Have you got the article?

A. Yes, I think the article is back there; Berichte 44, I think it is.

Q. 45. Is this the book to which you refer (handing book)?

A. This is one of them. This article to which I refer is the Berichte 44, No. 9, for May 20, 1911, and the suggestions are found on page 1260 and page 1261 for products of this nature. There is an additional reference.

MR. KRESEL: May I make a suggestion, your Honor? Would it not lend to clearness if this witness would first tell us what he did under the patent, and then, if he did something because of something else that he had read, let him tell it to us after that? This is going to confuse the thing. He says "I did this under the patent." Then he jumps to some German article. I have no objection to his giving the full information; but I think it would be much better for everybody concerned if he would first confine himself to the patent and then go to the next thing.

THE COURT: The witness may or may not adopt your suggestion, as he prefers.

THE WITNESS: I would be glad to adopt your suggestion, Mr. Kresel.

MR. KRESEL: I wish you would, Doctor, it would help me.

THE WITNESS: You will feel more at ease, and we will have the thing amicably settled. What you wish is that I should go through the patent first?

MR. KRESEL: Yes; please tell us what you did under the patent.

THE WITNESS: All right, sir. In following

the patent, as I have already pointed out to you, on line 34: "The procedure for preparing the new compound may, for instance, be as follows," and with that interpretation I prepared nitro-oxyphenylarsinic acid by two methods. I followed the patent explicitly, as described in the lines 33 to 50 inclusively, yielding the nitro-oxyphenylarsinic acid, which is regarded as the mother substance of arsphenamine, which is the dihydrochloride, this patent specifically mentioning the arsphenamine base.

In other words, it is a product not containing the two hydrochloride acid groups. In order to carry these experiments along simultaneously, I likewise prepared the nitro-oxyphenylarsinic acid by the conversion of the nitro-aminophenylarsinic acid into nitro-oxyphenylarsinic acid.

By Mr. Kresel:

Q. 46. That last step is not in the patent at all?

A. No, not specifically described here, but it says it may be made as follows.

Q. 47. I do not mean to interrupt you, but I simply want it clear. The last step of converting the nitro-amino into nitro-oxyphenyl is not described in the patent?

A. Not this particular patent.

Q. 48. That is what I mean. That is the one we are dealing with.

A. This nitro-oxyphenylarsinic acid was purified by re-crystallization by distilled water, for the reason that it is apparent—

Mr. Kresel: I object to his reason.

The Court: Sustained.

The Witness: It is purified and then it is dried, ready for the reduction process.

Q. 49. You mean you did it, not that it is done?

A. Yes, sir; I did it myself.

The second procedure which is described in this patent consists in the reduction of the product nitro-oxyphenylarsinic acid and that reduction was carried out by dissolving 66 grams of the nitro-oxyphenylarsinic acid in hot water at 50 degrees. This product then was converted into the sodium salt by the addition of concentrated sodium hydroxide.

In my experiment I used 88 per cent sodium hydro-sulphate and I used an amount of sodium hydrosulphite which would give me an amount equivalent to the 855 grams of anhydrous sodium hydrosulphite described in the patent. 171 grams of magnesium chloride was dissolved in the cold water at zero degrees, preparatory for the reduction. The sodium salt of nitro-oxyphenylarsinic acid was then poured into the reduction mixture with vigorous stirring. The temperature of the moisture, as I recall, was about 10 or 11 degrees Centigrade. The product was continuously stirred until the temperature reached about 30 degrees Centigrade, when a precipitate began to form. The reduction was continued until a temperature of 63 to 65 degrees was obtained, giving a complete precipitation of the arsphenamine or salvarsan base, as indicated by testing the solution which remained in the reduction kettle. This base was then allowed to settle and after the settling process had taken place so that most of it was lying at the bottom of the container, the super-natant liquid was siphoned off, leaving the reduced arseno compound in the container. This residue—

MR. KRESEL: You gave us all that before we adjourned.

THE WITNESS: You asked me to go through it again for you.

MR. KRESEL: I did not. Your counsel asked

you. This is exact repetition, your Honor, of what we had before.

THE COURT: Colonel Anderson, if that be your understanding, can we not shorten this by asking him to tell us what steps he took in addition to those described by him before we took the recess, and the authority for such additional steps?

MR. ANDERSON: I could ask him that, sir; or I could ask him to do what I first asked him, to state the sources of each act in the patent and the accompanying literature with which he was familiar and the reasons therefor and his interpretation of the patent.

THE COURT: By "reasons," you mean what?

MR. ANDERSON: The interpretation of the patent in the light of such literature; and if that interpretation is wrong, it is for the Court to say.

THE COURT: If you can abbreviate your answer by making reference to the answer given before recess, you may do that.

THE WITNESS: Briefly I can tell you the reason that I used a little higher temperature, because the reaction—

THE COURT: The only reasons that Colonel Anderson has asked you for are those which have been described in the literature which was read by you prior to your experiment, as I understand the question.

By MR. ANDERSON:

Q. 50. I intended to ask him for his interpretation of the patent so that the answer might be complete. His interpretation of the patent may or may not be right, but he is entitled to give his interpretation as showing what he did. Do you understand, Doctor, what we are driving at? Take your interpretation of the patent, together with the literature, and say

what you did, and give the sources of your authority for doing it under that patent?

A. The reason for re-crystallizing is found on page 12.

MR. KRESEL: I object to his reason for re-crystallizing.

THE COURT: You mean because it is stated as a reason, or because there is no authority in the patent for it, no instructions for it?

MR. KRESEL: I object to it upon both grounds, your Honor. In the first place, it is an operation of his mind, which is not at all material here, and secondly because there is nothing of that sort in the patent.

MR. ANDERSON: I think the operation of his mind is material.

Q. 51. Please say, doctor, the sources of your authority for re-crystallization?

MR. KRESEL: I object to that. This man does not need any authority for what he did. It is either in the patents or it is not.

MR. ANDERSON: It is to the contrary, your Honor.

MR. KRESEL: The patent speaks for itself.

MR. ANDERSON: This interpretation of the patent, taking its clauses together, indicated re-crystallization, and it is for him to say so. If the literature of the times suggests re-crystallization, it is for him to point to it.

THE COURT: We are dealing here with the value of the patent and not its validity; so I [illegible] assumed, Col. Anderson, in your question, that [illegible] had assumed the validity of the patent; and I assume that the defendant had likewise taken the patent as valid, but showing that it had been abbreviated with respect to the detailed instructions. Consequently I had assumed that your question

was directed to this, namely, as to whether in 1918, when he made his experiment, the literature with respect to such compounds was more extensive than it was probably in 1911, and that the value of the patent would have to be ascertained on April 10, 1919, in the light not only of the patent, which would be presumably valid, but in the light of all the literature, scientific literature, which might be read in connection therewith. Do I misunderstand the point?

MR. ANDERSON: Your Honor understands my position. I was trying to get it condensed, instead of going through the patent and saying that others did that and the literature did this, that is what the interpretation of putting the two together led him to do.

THE COURT: I do not know that is interpretation, but I will take his answer with respect to the re-crystallization, and he may tell us what authority he found in the literature on the subject in America at that time, which was generally known to those skilled in the art.

MR. ANDERSON: Your Honor, in saying in America he does not mean, of course, to exclude literature of foreign countries, which was in the libraries of America, in the University libraries and so forth, that has actually gone to make that clear to the witness.

THE COURT: No.

MR. ANDERSON: Now, you understand the Court's statement. Will you please proceed as best you can to respond to that suggestion.

A. The literature available at that time on the question of re-crystallization was based upon laws in that you might have dinitro compound form instead of all mononitro compound, which would lead to a reduction of the product known as the tetramonohydroxy-

arsinbenzol; in other words, there would be two nitro groups going on instead of one, and that product presumably was more toxic than the mononitro. Therefore, it seemed obvious that the re-crystallization should take place at that stage, in order to remove a product which undoubtedly will be formed in small quantities when keeping a very low temperature. The other factor which was dealt with at that particular point is that you may have side products formed which are formed to the parent substance, that is, by-products due to small reactions taking place, rather than giving you one large nitroxyphenylarsinic acid. The only way to remove those are by re-crystallization or a difference in solubility in various types of solvents; and the suggestion bearing out that particular feature is found in an article by the originators of the idea, Ehrlich and Bertheim, which was published on May 20, 1911.

THE COURT: What is the date of the patent?

MR. ANDERSON: March 7, 1911.

THE WITNESS: That is briefly covering it.

By MR. KRESEL:

Q. 52. Have you that available?

A. Yes, sir.

Q. 53. Is it in German or English?

A. That is in German.

Q. 54. Will you read it; have you a translation of it?

A. The article is by Paul Ehrlich and A. Bertheim, and the subject of the article is the reduction produced on arsinic acids and their derivatives and its decomposition products with the p. p. arsino benzene; and it describes the two methods of reduction, the step by step reduction and the direct reduction. The step by step reduction is one using the sodium manganese or some of its side products, the one which we are dis-

tinctly interested in here is the use of sodium hydrosulphite on the direct reduction.

Q. 55. Can you translate German?

A. I think I can.

Q. 56. Will you say what is your authority for doing that? Now, the page you are reading from is what?

A. Page 1261.

Q. 57. And what is the volume?

A. I beg your pardon.

MR. KRESEL: What is the volume?

THE WITNESS: Volume 44, No. 9.

MR. KRESEL: Of the Berichte?

THE WITNESS: Yes.

MR. KRESEL: Now, go ahead.

MR. ANDERSON: I would like to state to counsel that the witness did not say it was his authority, but that it was indicated or suggested in that authority and also indicated in the patent.

MR. KRESEL: I am not binding him down to a particular word.

THE COURT: I understood him to say the step was disclosed.

MR. KRESEL: That was my understanding You do not mind if I follow you in your German?

THE WITNESS: No. The reduction products contained not only small quantities of impurity, by-products, ash, residues, and the solution which is used in precipitation whose removal is very difficult. That is the principal feature. If the arsenal combinations were either directly distillable or even lent themselves to precipitation, still it would lead to their removal through crystallization because they possess many of the unknown colloidal substances. Chemically and physically they show themselves entirely opposite. That is the particular part.

By Mr. Anderson:

Q. 58. You can proceed. Is there any other literature or any other matter on the subject which you wish to state?

A. The production of the dihydrochloride is described to a considerable extent in the literature in Volume 45 page 756, et seq., of the Berichte.

Q. 59. Of what time?

A. 1912.

Q. 60. The dihydrochloride is the last product; after you have arrived at the salvarsan base provided for in the patent, then you produce the dihydrochloride in the method you have already indicated?

A. Yes, sir, that is the last stage.

Q. 61. And you say that was described in the publication to which you refer in 1912?

A. In addition to the patent.

Q. 62. Doctor, in following the procedure which you have outlined, what did you get?

A. Salvarsan base and salvarsan dihydrochloride.

Q. 63. Is salvarsan dihydrochloride the commercial product?

A. It is.

Q. 64. The quality used as a drug?

A. It is.

Q. 65. Did you test that chemically or biologically or both?

A. I did.

Q. 66. With what result?

A. It conformed to the test for salvarsan as outlined in the United States Public Health Service Bulletin.

Q. 67. In 1918?

A. The tests were made in 1918. I do not remember the exact date of that publication. (Examining papers.) Yes, 1918.

Q. 68. Did you personally see that product tested, that you produced?

A. I did it myself.

Q. 69. On what animals?

A. Not on any animals. The question which I think you intended to ask me was about these quantitative and qualitative tests?

Q. 70. Yes.

A. That is a chemical test without the use of animals.

Q. 71. Is that the test issued by the Public Health Service?

A. It is.

MR. KRESEL: It is what.

MR. ANDERSON: Issued by the Public Health Service of the United States.

MR. KRESEL: I do not understand that. Do you mean the test that you made is issued?

THE WITNESS: Yes, this right here.

Q. 72. Were then issued?

A. It is the Bulletin issued by the United States Public Health Service on the quantitative and qualitative test for arsphenamin and neo-arsphenamine, reprint No. 472.

By MR. KRESEL:

Q. 73. I did not understand you, Doctor. You mean the kind of test as prescribed by the Public Health Service; is that what you mean to say?

A. Yes, sir.

Q. 74. You do not mean to say that the very tests you made were published by somebody?

A. They were published by myself, yes.

Q. 75. In that?

A. Yes.

Q. 76. Let me see it?

A. (Witness hands pamphlet).

MR. KRESEL: Go ahead; do not wait for me.

By MR. ANDERSON:

Q. 77. And you did that as an officer of the Public Health Service?

A. I did.

MR. KRESEL: You need not wait for me; go ahead.

MR. ANDERSON: I was going to offer that paper in evidence.

MR. KRESEL: Go ahead; offer it (handing paper).

MR. ANDERSON: I would like to offer this paper in evidence as identified by the witness.

Received in evidence and marked "Plaintiff's Exhibit No. 684." (*See Exhibits, Vol. III, page 1743.*)

Q. 78. Have you any specimen of the salvarsan that you produced at that time?

A. I believe I have (producing specimen).

Q. 79. Have you got it there?

A. I have. (Handing.)

Q. 80. Was this produced in the manner which you have described in your testimony? This is called "Salvarsan Arsphenamine."

A. It was not prepared according to the last question asked me, in which I was to follow the patent specifically.

Q. 81. You did prepare some in accordance with that, did you?

A. I did.

MR. KRESEL: Pardon me, Colonel.

MR. ANDERSON: Then I will not introduce this. I thought he had some that he did prepare under that patent. He prepared this by other processes, so I am not interested in it in the slightest. The witness is with you now.

MR. KRESEL: Before I cross-examine the witness, if your Honor please, Dr. Bolton, as your

Honor knows, has been up late and he wants to get away. I have been keeping him here because Colonel Anderson several days ago requested us to supply him with some more figures with reference to the research cost of the duPont Company. I was afraid that if I did not have Dr. Bolton here, I might not be able to meet the requirements; so I have kept him here. I inquire, therefore, whether Colonel Anderson still wants those figures.

MR. ANDERSON: Yes.

MR. KRESEL: We have some here.

MR. ANDERSON: I am perfectly willing to suspend the examination at this point, for the courtesy of Dr. Bolton, and let the figures go in.

MR. KRESEL: I do not need to call Dr. Bolton. I will offer the figures. But you may want to call him. That is the reason I have been keeping him here.

If your Honor please, Colonel Anderson wanted these figures that we supplied here cut up by years. We have done that from 1916 to January 1, 1923. There is a copy (handing paper to Mr. Anderson).

Dr. Bolton, perhaps you had better take the witness stand. There may be a question or two we want to ask you.

ELMER K. BOLTON.

ELMER K. BOLTON, recalled for further examination, having been duly sworn, testified further as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 580. Dr. Bolton, have you now produced a statement showing the research expenditures of the

duPont Company covering products licensed from The Chemical Foundation beginning in 1916 and down to January 1, 1923?

A. I have.

Q. 581. The total thereof is how much?

A. On page 8 is found the total expenses for products licensed from The Chemical Foundation amounting to $640,656.88. I would like, if possible, to make a brief explanation in regard to these figures.

Q. 582. Will you do it, please?

A. In the early days when we began the work in the dye industry, you will appreciate that we had a very difficult problem in building up an organization; and that difficulty also extended to our accounting department. In those days, there was considerable confusion in accounts. We had open accounts. For example, as to indanthrene, everything was charged to that account which was carried on on any indanthrene dye and it is quite possible that some expenditures were charged there that should not be charged there and other expenditures were charged some other place, so that there was a certain amount of confusion. Now, this statement contains the figures for which we can vouch. We know that we have made these expenditures, but the statement is not complete. The amount is larger than given here. I can illustrate that by a general account which we had for indanthrene amounting to something over $21,000 and that was stretched over a period of three years, covering work at the experimental station. But we have not inserted that. So that the totals will give you a very good idea of the amount of money which has been invested in research work, but it will not tell you the whole story on account of the disorganization at that time in the accounts.

Q. 583. Is that all you want to say about that?

A. That is all I care to say about that.

MR. KRESEL: You can examine, if there is anything you want, Colonel Anderson. I offer this statement in evidence.

THE COURT: Admitted.

Received in evidence and marked "Defendant's Exhibit No. 373." (*See Exhibits, Vol. V, page 3469.*)

CROSS-EXAMINATION.

By MR. ANDERSON:

XQ. 584. Doctor, of course, you did not have anything to do personally with the keeping of the accounts?

A. No, sir.

MR. KRESEL: Do I understand there is any objection on that ground? Because if there is, I have Mr. Eliason here.

MR. ANDERSON: No, I am perfectly willing to admit on the record that if Mr. Eliason went on the stand, he would say he made up this statement from the accounts of the duPont Company. I do not want to have any question about that at all.

XQ. 585. Do you know whether what you call intermediate or laboratory work is included in this?

A. This includes all the experimental expenditures which come under research. That includes laboratory and small scale experimental work. It does not include any manufacturing accounts.

XQ. 586. As I understand, you first have the laboratory work and then when you get to a point where you think it is about ready for commercial production, you test it out in what you call a small scale or intermediate work?

A. Test it out in miniature plants in quantities of ten to as high as fifty pounds of the product, which may be manufactured at one time.

XQ. 587. That expense is included in this statement?

A. That expense is included in that statement.

THE COURT: Are you through with Dr. Bolton on both sides?

MR. ANDERSON: I think I will let Dr. Bolton go to bed.

MR. KRESEL: Is it all right to let Dr. Bolton go?

MR. ANDERSON: As far as I am concerned.

CHESTER N. MYERS resumed the witness stand.

CROSS-EXAMINATION.

By MR. KRESEL:

XQ. 82. I understand, Dr. Myers, that between 1914 and 1919, you were in the Government service?

A. I was.

XQ. 83. And you were connected with the Public Health Service?

A. I was.

XQ. 84. The Hygienic Laboratory?

A. I was.

XQ. 85. That is the laboratory that had under supervision the testing of arsphenamine for toxicity?

A. It is. .

XQ. 86. And that work started in 1917?

A. Approximately.

XQ. 87. And under the governmental directions, all manufacturers of arsphenamine were obligated to send samples of their production for testing by the Hygienic Laboratory?

A. They were.

XQ. 88. You said something about having been instructed by your superiors to go to the Metz Labora-

tories in 1918. Whatever instructions you received, were those in writing or were they verbal?

A. They were in writing.

XQ. 89. From whom were the instructions?

A. Surgeon-General of the United States Public Health Service.

XQ. 90. Surgeon-General of the United States Public Health Service. Just who was he?

A. He is the officer in charge.

XQ. 91. I mean the name?

A. Oh, the name—Dr. Cumming.

XQ. 92. And were those instructions directed to you or were they directed to your superior in the Hygienic Laboratory?

A. They were directed to me.

XQ. 93. To you personally?

A. Yes, sir.

XQ. 94. Where is that writing containing the instructions?

A. With the account; with my expense account.

XQ. 95. Well, that does not tell me where it is.

A. Well, I do not know either.

XQ. 96. Well, where do you file your expense account?

A. With the Secretary of the Treasury, in some division.

XQ. 97. Pursuant to those instructions, did you go to the Metz Laboratory?

A. No, sir.

XQ. 98. Then did you ever go to the Metz Laboratories?

A. What is the question again?

XQ. 99. Did you ever go to the Metz Laboratories?

A. The previous question?

XQ. 100. I asked you whether pursuant to those instructions you had gone to the Metz Laboratories?

A. I just didn't get that question. I did.

XQ. 101. When did you go there?

A. On July 5, 1918.

XQ. 102. How long did you remain there?

A. Some time about the middle of November.

XQ. 103. 1918?

A. Yes, sir.

XQ. 104. And then did you resume your duties in the Hygienic Laboratory?

A. I did.

XQ. 105. Between July and November did you spend all your time at the Metz Laboratories?

A. I did not.

XQ. 106. Did you also perform duties in Washington?

A. I did.

XQ. 107. Did you spend most of your time at the Metz Laboratories?

A. I did.

XQ. 108. Is it the fact that you were sent to the Metz Laboratories in order to help those Laboratories produce a pure arsphenamine?

A. I was not.

XQ. 109. Is it the fact that when you went to the Metz Laboratories they were not producing a pure arsphenamine?

A. Not to my knowledge.

XQ. 110. Is it a fact that up to the time that you were sent to the Metz Laboratory they had had difficulty in producing an arsphenamine with a sufficiently low toxicity to pass the United States Health Service test?

A. There was a difference of opinion.

XQ. 111. What did you do between July and November, 1918, at the Metz Laboratories?

A. Investigated arsenicals.

XQ. 112. That is, you were prosecuting experimental work?

A. I was.

XQ. 113. Research work?

A. I was.

XQ. 114. Just for the information of the Hygienic Laboratory?

A. I was.

XQ. 115. Not for Metz?

A. Not for Metz.

XQ. 116. You did not in any way divulge to the Metz Laboratories the results that you obtained?

A. I did not.

XQ. 117. You in no way assisted them in producing arsphenamine?

A. I did not.

XQ. 118. At any time between July and November, 1918?

A. Between July 5th and November, 1918.

XQ. 119. Prior to your going to the Metz Laboratories you had been prosecuting research at the Hygienic Laboratory?

A. I was.

XQ. 120. You had had all the facilities there that were necessary to prosecute that work?

A. I did not.

XQ. 121. What facilities did not the United States give you that you had at the Metz Laboratories?

A. Actual contact with large scale production.

XQ. 122. You mean that the Metz Laboratories produced in large quantities; is that it?

A. Relatively.

XQ. 123. Were you experimenting in factory production or in laboratory production?

A. In laboratory production.

XQ. 124. Then why did you not prosecute your work as well at the Hygienic Laboratory?

A. For the reason that I was not in contact with actual process operation.

XQ. 125. But you have told me that your research work was laboratory work?

A. Yes, sir.

XQ. 126. That was the kind of work you had been doing before 1918?

A. Yes, sir.

XQ. 127. Dr. Myers, when did you enter the employ of the Metz Company?

A. About March, 1919.

XQ. 128. So, having worked in his place, between July and November, 1918, three or four months thereafter you entered his employ?

A. I did.

XQ. 129. And have been in his employ ever since?

A. I have.

XQ. 130. Have you had charge of his factory which manufactures salvarsan? I mean technical charge.

A. No, if I may explain.

XQ. 131. Wait a minute before you explain. Perhaps my question was not clear.

A. It covers a good deal.

XQ. 131A. I do not mean that you are the foreman there or anything of that sort; I mean you are in charge as the chemist there. Or am I wrong about that?

A. Your question covers a great many points.

XQ. 132. I will not enter into that. If that is not the fact, you will pass on.

A. I will answer your question for you. I am in charge of the Research section.

XQ. 133. And have been since March, 1919?

A. I have.

XQ. 134. Now, Dr. Myers, I am perfectly willing to accept your statement if you want to leave it that

way—that the United States Government sent you to do laboratory research work at the Metz Laboratories, that you stayed there from July to November; and that that was not done for the purpose of helping Metz produce a proper arsphenamine. That is your statement, is it?

A. Yes, sir.

XQ. 135. But there was some difference of opinion as to whether he was producing a good arsphenamine; is that your testimony?

A. I believe that is correct.

XQ. 136. And you knew of that difference of opinion as an official of the Hygienic Laboratory, did you not?

A. I did.

XQ. 137. Dr. Myers, is it not a fact that in or about the month of July, 1918, you were employed by Mr. Metz to come to his factory to help him to put out a good arsphenamine?

A. I was not.

XQ. 138. You know Dr. Lake?

A. I do.

XQ. 139. He was connected with the Public Health Service too, was he not?

A. He was.

XQ. 140. Didn't you and Dr. Lake go over to Metz's laboratory about July, 1918, to help him out?

A. We did not.

XQ. 140 (continuing)—to make a good arsphenamine?

A. We did not.

XQ. 141. Did Dr. Lake?

A. I don't know.

XQ. 142. Was he there in July, 1918?

A. He was not.

XQ. 143. Was he ever connected with the Metz Laboratories?

A. He was.

XQ. 144. When?

A. About 1920.

XQ. 145. Not before?

A. I stand by my answer, as near as I am aware.

XQ. 146. I will come back to this subject when I get the letters. Dr. Myers, I am not yet clear whether you testify that you made any arsphenamine by strictly following the specifications in this patent. Did you or did you not?

A. With my interpretations.

XQ. 147. I do not want your interpretations. We will come to your interpretations later. Did you or did you not, by simply and strictly following the steps described in this patent manufacture arsphenamine?

A. I produced nitro-oxy as described in the patent.

XQ. 148. Did you or did you not by simply and strictly following the outlines in this patent produce arsphenamine?

A. I produced nitro-oxy.

XQ. 149. And not arsphenamine?

A. I just went to the nitro-oxy stage.

XQ. 150. Did you produce arsphenamine?

A. I did.

XQ. 151. Why did you hesitate, and it took me half a dozen questions to get the answer?

A. I did not hesitate.

XQ. 152. Do you say now that by simply and explicitly following these steps in Patent No. 986,148 you manufactured arsphenamine?

A. I did not.

XQ. 153. Now I have both answers; that you did and that you did not. Which is true?

A. Both are true.

XQ. 154. Both are true? Very good. I think that is a chemical reaction. (No answer).

XQ. 155. Dr. Myers, can you make nitrooxy-

phenylarsinic acid by treatment of nitro-arsinilic acid with ammonia?

A. Not to my knowledge.

XQ. 156. Is it true that in order to make good arsphenamine nitrooxyphenylarsinic acid must be free of certain impurities?

A. It is preferable.

XQ. 157. Is it true that it must be free of certain impurities, in order that it may be a safe drug to administer into the veins of a human being?

A. Yes, depending upon the dose.

XQ. 158. Is it true that it must be free of dinitro-oxyphenylarsinic acid?

A. It is preferable.

XQ. 159. Is it true that it must be free of that element in order to make it a safe drug to inject into the veins of a human being?

A. It is preferable.

XQ. 160. Is it safe to inject into the veins of a human being any arsphenamine which contains dinitro-oxyphenylarsinic acid?

A. In some doses, small doses.

XQ. 161. How small?

A. I do not know.

XQ. 162. Is it true that in order to obtain an arsphenamine of low toxicity, you must work at a temperature below zero?

A. With what?

XQ. 163. With the oxyphenylarsinic acid?

A. Would you repeat your question.

XQ. 164. Will you read the question? (XQ.162 and 163 repeated.)

A. There is no connection between the first product and the last product which you have questioned me about.

XQ. 165. Then your answer is no?

A. It is not. I can not give you an answer. They are two isolated compounds.

XQ. 166. Then your answer is that you can not answer the question?

A. I can not answer the question.

XQ. 167. Have you got the patent before you? I am reading from the answer that you gave before recess as to what you had done to produce arsphenamine. You said, referring to the nitro product that a warm solution of nitro-oxy was poured into the cold solution of sodium hydrosulphite with continued and vigorous stirring. I would like you to read that to me from the patent.

A. The words which you have read are not found in the patent.

XQ. 168. You said that the container in which the mixture was placed was surrounded by a water jacket so that the temperature might be increased at a gradual increase of temperature. I would like you to read me from the patent anything of that nature.

A. Line 67.

XQ. 169. Read it.

A. "On digesting the solution at 50 degrees Centigrade a light-yellow, microcrystalline precipitate separates which consists of the diaminodioxyarsenobenzene."

XQ. 170. Let me read the question to you again, and I will leave it to you to say whether that is an answer to it. The question is this: You said the container in which the mixture was placed was surrounded by a water jacket so that the temperature might be increased at a gradual increase of temperature." Read me what there is in the patent of that nature.

A. "On digesting the solution at 50 degrees C., a light-yellow, microcrystalline precipitate separates which consists of the diaminodioxyarsenobenzene."

XQ. 171. You say the temperature at which the

precipitate known as the arseno base came out of solution was about 50 degrees Centigrade. Then you say the reduction was continued until a temperature ranging between 50 and 55 degrees was attained. Give me the line in the patent which speaks of a temperature between 50 and 55 degrees?

A. On line 68 it says, "Digesting the solution at 50 degrees Centigrade.'

XQ. 172. Fifty degrees?

A. Yes, sir.

XQ. 173. It does not say anything about 55, does it?

A. It does not.

XQ. 174. Nor does it say anything about "between 50 and 55," does it?

A. It does not.

XQ. 175. You continue in your answer as follows: "After allowing the reduction to continue for a period of about one hour and a half, the solution and suspension were allowed to stand, thereby allowing the reduced product known as arseno base to collect at the bottom of the container." Read me anything out of that patent which speaks of allowing the reduction to continue for a period of about one and one-half hours?

A. Line 70: "Its separation is completed by gently heating for some time."

XQ. 176. I continue: "The precipitate was then collected upon a filter and protected by means of carbondioxide, using vacuum for the separation of the solid and the liquid." What is there in the patent that speaks of precipitating the stuff upon a filter and protecting it by means of carbondioxide?

A. That is not my statement, precipitating it on a filter.

XQ. 177. I will read it again: "The precipitate was then collected upon a filter"—

A. Yes, sir.

XQ. 178. "And protected by means of carbondi-oxide."

A. Yes, sir.

XQ. 179. Read out of the patent where that is referred to.

A. "When filtered off."

XQ. 180. That is all?

A. Yes, sir.

XQ. 181. You then say: "This material was washed with cold distilled water until no acid reaction was obtained." What is there in the patent that speaks of that?

A. "When filtered off and dried."

XQ. 182. Then you go on and say that when the base had been thoroughly separated from the chemically held liquid, it was suspended in methyl-alcohol and treated with hydrochloric acid in methyl-alcoholic solution. Read me what the patent says about that.

A. "Its dihydrochlorid, which may be precipitated from the methylalcoholic solution by ether."

XQ. 183. That is all?

A. Yes.

XQ. 184. You spoke at one point in your direct testimony this evening about using a temperature between 63 and 65 degrees. At what point in the procedure did you use that temperature?

A. At the end of the reduction.

XQ. 185. Read me anything in that patent that speaks of using a temperature of between 63 and 65, in any step?

A. I made no suggestion of it.

XQ. 186. No suggestion of what?

A. I have made no suggestion that I took that statement from the patent.

MR. KRESEL: That is all. I may want to ask the witness another question. I have sent for a paper at the hotel, your Honor.

XQ. 187. I do not suppose you are going to leave right away?

A. No, sir; I will be here as long as you wish.

MR. KRESEL: That is all.

RE-DIRECT EXAMINATION

By MR. ANDERSON:

RDQ. 188. You have in several of your answers referred to the patent as interpreted by you. Can you define more clearly what you mean when you say you produced salvarsan under the patent as interpreted by you?

MR. KRESEL: If your Honor please, I must object to that. This witness was questioned both upon the direct and upon the cross as to whether he did or did not carry out the specifications in the patent. What his answers were your Honor knows. I do not think at this time, upon the redirect, the witness should be permitted to state what interpretation he placed thereon. I do not think that is a question of expert testimony.

MR. ANDERSON: I assume that we are trying to get at the facts.

MR. KRESEL: I had been assuming that for some time. I have given it up.

MR. ANDERSON: That is obvious, you have. What I wanted to say was this: When a scientist or an expert in a science gets on the stand and you ask him if he followed A, B, C—that is one thing. But if he is a man skilled in any art, like a lawyer when he reads a paragraph from a book, he reads it in the light of the general principles of the law which are assumed to be within his mind and the mind of the court. He does not have to follow that up by a letter. The same way with any expert or scientist. He must read a technical formula in the light of the general chemical knowl-

edge which he is supposed to possess. It means something to him and indicates certain conditions required, certain surrounding conditions as it does certain appliances and apparatus for the carrying out of the formula; while to a man like myself, who knows nothing of chemistry in the technical sense, it would mean nothing.

What I think is essential, if I may suggest, is how did this witness or any other witness read that patent? In other words, he may have read it wrong, but that is for your Honor to determine. How did he read it is an essential thing to ascertain whether he was acting within the reasonable intent and meaning of the patent or not. After all the law is supposed to be common sense and that is the common sense of it. I do not know what the Patent law is.

THE COURT: I think the objection is well taken. The question is not proper in re-direct examination. You may recall the witness and ask him the question in that manner if you so desire. I will then hear any objections that there may be to the question.

MR. ANDERSON: I then avail myself of your Honor's consent to recall the witness. I will have the question read and ask Dr. Myers to answer it.

(RDQ. 189 repeated as above recorded.)

THE COURT: Do I understand there is no objection to this on re-direct?

MR. KRESEL: No, your Honor. My objection lies to this question even though the witness be considered to be recalled for direct. I consider it is immaterial and irrelevant and not binding.

THE COURT: I think the objection is well taken, but in order to save time I will permit the answer to be taken of record.

A. Before actually preparing these products, I gained access to a complete literature on the subject of arsenicals.

MR. KRESEL: Will you please stop there a moment. I move to strike that out, first, as not responsive and second, as repetition.

THE COURT: Motion granted. Repeat the question.

(RDQ. 189 repeated as above recorded.)

A. My interpretation of the reduction process described in this patent was such that I knew that a few degrees increase in temperature would hasten the reaction, a condition which is known to every man who has had advanced training in chemistry.

MR. KRESEL: I object to his statement that it is known to every man who has any knowledge of chemistry, which it is obviously impossible for this man to swear to, and I ask that that part be stricken out.

MR. ANDERSON: I think that that is one of the facts of the case, sir, that there are certain matters that are supposed to be within the knowledge of every trained man.

MR. KRESEL: He did not even say "supposed to be." He said they were within the knowledge of everybody.

THE COURT: Can he testify to that as a fact?

THE WITNESS: I said, to every man trained in advanced chemistry.

MR. ANDERSON: Claiming knowledge of chemistry, as I understood his language.

MR. KRESEL: Just have it read and your Honor will see.

MR. ANDERSON: Strike it out and repeat the question, please. Let us go on.

(RDQ. 189 repeated as above recorded.)

A. It is known to me that reactions proceed with

greater rapidity at a higher temperature than they do at a lower temperature. It was therefore obvious that I could accomplish the same results of reduction in a shorter period by an increase of temperature; and having worked on this type of products, it was obvious that my interpretations would lead to a product possessing the same chemical properties as those specifically described in the patent and verified by chemical tests applied to the arsphenamine base so obtained, according to these directions.

MR. KRESEL: Will you stop there a minute. I now move to strike that part of the answer out as not responsive.

MR. ANDERSON: I cannot see why it is not. That is his interpretation of the question. The question of whether it is a right interpretation is for your Honor to decide. That is what the question is intended to draw forth and such a reply is appropriate.

THE COURT: I do not see how that is an interpretation of the patent. I do not see how it can be. If the patent specifies a temperature of 50 degrees, I do not see how it can be interpreted to mean 55. Did you say 55 to 60, or 55?

THE WITNESS: 55.

MR. ANDERSON: 50 to 55.

By THE COURT:

Q. 190. Did you say 50 to 55, or 55?

A. 55, your Honor. I may add one other thing, in line 70 it says, "separation is completed by gently heating for some time." In order to overcome the indefiniteness of "some time," you have one procedure available, and that is to raise the temperature, complete your reaction within a fixed time, test the solution if there is any more of the reaction—

Q. 191. Then what you say is, that the method

you pursued was an equivalent and not the method of the patent?

A. It is an equivalent and to my mind was the patent, because that line 70-71 says "separation is completed by gently heating for some time."

MR. KRESEL: May I ask a question here?

THE COURT: You may.

MR. KRESEL: Well, never mind; I will wait.

THE COURT: You may take the answer, and you may cross-examine fully, Mr. Kresel. We will save time that way, I think.

By MR. ANDERSON:

RDQ. 192. You were asked as to the purification of the nitro-oxy acid, to be brief. May I ask you why you purified the nitro-oxy acid?

MR. KRESEL: I object to that as being immaterial.

THE COURT: That question was asked in chief and gone over fully, and he said in chief that he based that step upon the German translation which he made, is that not correct?

MR. ANDERSON: I do not remember, sir.

By THE COURT:

Q. 193. Isn't that correct, Dr. Myers?

A. Yes, sir.

By MR. ANDERSON:

RDQ. 194. You were asked about the expression in your answer, before adjournment of vigorous stirring during a certain period of reduction. What was your authority for that statement?

MR. KRESEL: That has been gone over, your Honor, both on direct—

MR. ANDERSON: No, we did not go over that on direct. Your Honor is quite right; I did ask him about the acid, although I am not sure what the question was.

THE COURT: You may take his answer again.

A. The question of vigorous stirring is one which involves the fineness and physical condition of the powder which is produced. The powder and the physical condition of the powder so produced is a factor which determines the toxicity in a certain measure of the final product in the form of a disodiumphenylate used for intravenous injection.

RDQ. 195. In your opinion as a chemist, was such a treatment or method indicated by the character of the process?

A. It was.

MR. KRESEL: One minute; I object. May the answer be stricken out?

THE COURT: Strike out the answer.

I did not understand the question, Colonel Anderson. Won't you have it read to you? It may be clear to you, though it is not to me.

(RDQ. 195 repeated as above recorded.)

THE COURT: You mean by the patent?

MR. ANDERSON: Yes, by the character of the process embodied in the patent and the nature and use of the drug to be produced thereby.

MR. KRESEL: Surely the nature of the drug hasn't anything to do with it.

MR. ANDERSON: I submit that the use of the drug has a very important bearing upon the interpretation and meaning of a patent. In other words, it is elementary that a man using a high degree of dangerous instrumentality—it does not matter what it is; whether it be a locomotive engine or a motor car or drug—is supposed to exercise a high degree of care in its use and its production.

THE COURT: No; the question here is as to whether the patent is sufficiently explicit in the technique or in the method of following the steps

specified in this patent; for instance, heating for some time.

MR. ANDERSON: Quite true, sir; but if there is a general principle universally recognized applicable to such things by those skilled in the art, then that is supposed to be read into the patent as well as gained from the literature. Now, if such things are indicated to those skilled in the art by the very nature of the process, the product and the use, why, then it necessarily follows that they are supposed to know and use this method.

THE COURT: Will you read the question, please?

(RDQ. 195 repeated as follows:)

RDQ. 195a. In your opinion as a chemist, was such a treatment or method indicated by the character of the process embodied in the patent and the nature and use of the drug to be produced thereby?

THE COURT: You mean was it indicated by the patent?

MR. ANDERSON: Yes, sir.

THE COURT: You may take his answer to that question.

A. Having read the original description of the production of the dihydrochloride by Ehrlich and Bertheim, page 756, Volume 45, 1912, at the bottom of page 764 he brought up the question of colloidal condition of the product, therefore having been studying colloidal absorptions at that particular period, it naturally occurred to me that I should look out for that particular feature.

By THE COURT:

Q. 196. Would a person who had not read that particular book to which you referred be a person skilled in the art to which this patent belongs, in your opinion?

MR. ANDERSON: Would your Honor permit—

Well, I will not object to the Court's question; I can not do that. I want your Honor to get all the information you want on the subject.

A. May I give an explicit answer, your Honor?

Q. 196. (continued) Yes.

A. As I have already stated, your Honor, I believe that it is necessary that you should have both the chemical and medical touch simultaneously in the production of intravenous products, and those who should be engaged in the manufacture of products of this kind were, as originally described in the patent. You referred to the patent. One was a physician and the other was a chemist. They were using a combination of conditions, medical and chemical. To my mind, those who work with arsenicals or drugs of any kind for intravenous medication should know the physiology, the pharmacology and the chemistry of those products. Without knowing them, you are leaving a great loop hole in the actual administration and preparation of drugs of this nature.

It is one of the explanations of a series of failures and upsets that have arisen from the preparation of this particular type of drug. The same thing occurred in England and is found in His Majesty's Stationery Report, I think it is No. 44, about Colonel Harrison of the Medical Corps, in which they went into those same features, and it is only by access and continuous contact with medical men at the Hygienic Laboratory in Washington, D. C., that we were able to exchange our ideas and arrive at definite means of producing a satisfactory drug.

Q. 196a. You mean salvarsan?

A. Salvarsan and diaminosalvarsan.

MR. ANDERSON: I think that is all, sir.

MR. KRESEL: I have reason to believe that there is in the possession of Professor Stieglitz, a letter which would be of assistance to me in com-

pleting the cross-examination of this witness. Professor Stieglitz takes the position that he cannot, without an order from the Court, allow me to see that letter. I now make application to the Court that Dr. Stieglitz be instructed to let me inspect the letter.

MR. ANDERSON: I think that Dr. Stieglitz under the circumstances ought to take the stand and state the circumstances of the letter. I do not want to object——

MR. KRESEL: That is all right. I am quite willing to call Dr. Sietglitz to take the stand.

THE COURT: Mr. Myers, will you retire from the stand a moment.

JULIUS STIEGLITZ resumes the stand.

THE COURT: Dr. Stieglitz, the general order which I made with respect to your disclosures and documents when you were first on the stand applies to any questions which may now be asked you, by either counsel for the defendant or for the Government. It likewise applies to any documents in your possession, and you are now directed to make full disclosures of both documents and facts in reply to such questions as may be asked you.

RE-DIRECT EXAMINATION.

By MR. KRESEL:

RDQ. 231. Dr. Stieglitz, have you any letter from Herman A. Metz or the Metz Laboratories, wherein the name of Dr. Myers, the preceding witness, is mentioned?

A. I have.

RDQ. 232. Have you more than one such letter?

A. Not from the Metz Laboratories.

RDQ. 232A. Have you any from the Metz Laboratories?

A. Only this one.

RDQ. 233. Only one?

A. Yes.

RDQ. 234. Now, I ask you to produce that.

A. As far as I have looked through my files, but I have this one.

RDQ. 235. I ask you to produce that now?

A. I have it here (handing letter).

MR. KRESEL: That is all. I am going to use it in examining Mr. Myers.

MR. ANDERSON: Now that Dr. Stieglitz is on the stand, I wish to move to strike out each question and answer in the evidence given by him, both in the Court and in Chambers, when he was formally on the stand, which does not appear on the face thereof to have been within his own knowledge on the ground that it is hearsay. At that time, if your Honor will recall, I am not sure from the record whether at the time this evidence was taken, although it was indicated by one statement of the Court, that it is subject to objection, at the conclusion of the case, and therefore I wish to make that motion. I can make it more specific if desired, but it would take time, but I desire to reserve that objection to the testimony.

THE COURT: Have you anything to say, Mr. Kresel?

MR. KRESEL: No, your Honor.

THE COURT: I think it unwise to consider the motion until it is specific, instead of general. Your motion has now been made, and you may make it specific at your convenience.

MR. ANDERSON: I would like to take time to indicate the exact questions and answers, but it

would now require me to go over Dr. Stieglitz's testimony, and I only want to reserve the point of my objection while the witness is on the stand.

Mr. Kresel: That is all. Now, Dr. Myers, I would like to ask you a few questions.

(Witness excused.)

Chester N. Myers resumes the stand.

Re-Cross-Examination (Continued).

By Mr. Kresel:

RXQ. 197. I ask you again, Dr. Myers, whether when you went to the Metz Laboratories in July, 1918, you did not go there in order to examine their processes and report thereon to the Public Health Service with reference to whether or no they were making a proper arsphenamine?

Mr. Anderson: I object to that question in its form, your Honor, for the reason that the witness did not testify that he did not go there for that purpose. He asked him again. That was not a question.

The Court: Read the question. (Question repeated as recorded.)

Mr. Kresel: Strike out the word "again." (Question repeated.) Will you answer it, please?

The Witness: Please read the question as final.

(RXQ. 197 repeated as amended: "I ask you, Dr. Myers, when you went to the Metz Laboratories in July, 1918, you did not go there in order to examine their processes and report thereon to the Public Health Service with reference to whether or no they were making a proper arsphenamine?")

A. I did.

RXQ. 198. Then you did not go there to do experimental work?

A. I did.

RXQ. 199. Then you went for both purposes?

A. There is only one purpose.

RXQ. 200. Well, was the purpose in order to determine whether their product was a proper product or not?

A. It was not.

RXQ. 201. Was the purpose in order to determine whether their product was good arsphenamine and for the purpose of reporting thereon to the Public Health Service?

A. The purpose of my visit was to report to the Public Health Service that which I observed and found.

RXQ. 202. What were you asked to observe and find?

A. That which I could see.

RXQ. 203. Do you think that that was a proper answer to the question, Dr. Myers?

A. I do, sir.

RXQ. 204. You were told to go there and look and report what you saw; is that what you want the Court to understand?

A. And to report, yes, sir, all of which reports you will find in Dr. McCoy's possession.

MR. KRESEL: I ask that "all of which reports you will find in Dr. McCoy's possession" be stricken out.

THE COURT: Motion granted.

RXQ. 205. Did you go there, Dr. Myers, in order to find out how they were making their arsphenamine?

A. I knew.

RXQ. 206. Did you go there in order to find out how they were doing it and reporting thereon to the Public Health Service?

A. It was known to the Public Health Service.

MR. KRESEL: I am afraid, your Honor, that I cannot make the witness answer questions, if he won't do it.

MR. ANDERSON: I do not think the witness refused to answer the question.

MR. KRESEL: I am perfectly willing to leave that to the Court. There is no argument about it at all. I will try again.

THE COURT: Do you want the answer stricken out?

MR. KRESEL: No, your Honor. I would rather have it stand, so that we may read it later.

RXQ. 207. I ask you again, Dr. Myers, whether you did not go to the Metz Laboratories in order to find out how they were making their arsphenamine, and make a report thereon to the Public Health Service?

A. I did.

RXQ. 208. And did you follow out your instructions?

A. I did.

RXQ. 209. Did you during the five months that you were there at the Metz Laboratories make any suggestions to the Laboratories as to how to improve their product?

A. I did not.

MR. KRESEL: I offer this letter in evidence.

MR. ANDERSON: While I do not think it is admissible, I am not going to object to it.

THE COURT: Admitted.

Received in evidence and marked "Defendant's Exhibit No. 374." (*See Exhibits, Vol. V, page 3489.*)

RXQ. 210. I do not recall whether I asked you if you are still working for Mr. Metz?

A. You did.

RXQ. 211. And you are?

A. I am.

MR. KRESEL: May I read that letter, please. This is directed to Dr. Julius Stieglitz and is dated August 13, 1918, after this gentleman had gone there (reading Defendant's Exhibit 374).

RXQ. 212. Did you go through all their processes for the Public Health Service?

A. I did.

RXQ. 213. Now, why did you do that?

A. Because I was directed to.

RXQ. 214. Well, why did the Public Health Service want to go through Metz's processes?

MR. ANDERSON: I object, if your Honor please. He was directed to go there. The reason why the Public Health Service wanted to have him do that is not for this witness to say. He was obeying orders. It is entirely outside of any re-direct examination. This is an entire reopening of the whole thing.

THE COURT: You mean outside of any cross?

MR. ANDERSON: Any direct or re-direct. The whole thing has come up on cross-examination. I did not object. It looked like he wanted to get the information that Dr. Stieglitz had and I was taking the position that I would not object to any of it. Now he asks why the Public Health Service wanted to do something.

MR. KRESEL: If he knows. He was an officer thereof. He was doing the work.

MR. ANDERSON: He said he was obeying orders. He was sent there under orders by the Surgeon-General in charge of Public Health.

RXQ. 215. Let me put it this way. Do you know why the Public Health Service wanted that information?

A. I do not.

MR. KRESEL: Then I can not inquire why. That is all.

MR. ANDERSON: You can stand aside, Dr. Myers.

(Witness excused.)

MR. ANDERSON: May it please the Court, while I am looking for a letter, I would like to introduce certain documents in rebuttal to certain evidence introduced by counsel. It will be recalled that during the progress of the cause, when counsel read from certain of the Congressional records into the record, I reserved the right on rebuttal to read in some additional portions of the same record bearing upon this act.

MR. KRESEL: Which act is this?

MR. ANDERSON: The act of March 28th, 1918. Counsel read one statement from Senator Underwood, who was in charge of the bill, the amendment of March 28th. I only want to read two short paragraphs. In order to save reading a long discussion to your Honor, I will state what your Honor examining the record will be able to verify, that the conference committee, consisting I think of Senator Martin of Virginia, Senator Underwood in charge of the bill, and one other person—I have forgotten his name—returned this bill with the amendment of March 28th, to the Senate, and it was a portion of that debate which was read to your Honor.

In discussing the provision with respect to the power of the President to order a private sale, which was the subject of debate at the time, Mr. Underwood said:

> "As to the item referred to by the Senator from New Jersey, the only changes made in that item were to specify more distinctly the terms and conditions of public sale and

to authorize the President when he directed that it should be done and gave in writing his reason for so doing, to set aside one of these sales.

"The personal action of the President is required to accomplish that result and he is required to give in writing his reasons therefor. It seems to me clear that there ought to be that opportunity under the Act. Cases may arise when you can not reach the desire of the Government to protect this property or the desire of the Government to take it away from an alien enemy by public sale, and if the President of the United States, acting himself and not through an agent, determines that it is necessary to be done, and in writing gives his reasons for doing so, it seems to me that is ample protection to the public and to the property."

That from which I have read is at page 4003 of the Congressional Record for March, 1918.

Your Honor will recall that at an earlier stage of the proceeding it was first agreed that both sides would be allowed to refer to this booklet entitled, "Trading With the Enemy Act," and to any Executive orders therein, either upon the trial, appeal or the re-trial of this case. Subsequently counsel for the defendant decided to put in certain Executive orders. That being true to the end that no question may be raised I reserved the right to put in others. I now desire to introduce in evidence the Executive orders in this book which have not already been expressly introduced, and I will call them off for convenience and ask that they be indicated by proper and appropriate numbers.

MR. KRESEL: Does that mean, Colonel, that you are offering all that are not already in?

MR. ANDERSON: As far as we know, and Mr.

Galloway states that they are. I may state in addition that it is my view the Court will take judicial notice of them anyhow. But we want to make the record consistent. I will just read them off this list as given to me by my associate, and the book may be taken and the Clerk give them appropriate numbers.

Page 27, Executive Order of October 29th, 1917.

Received in evidence and marked "Plaintiff's Exhibit No. 685." (*See Exhibits, Vol. III, page 1759.*)

MR. ANDERSON: Page 28, Executive Order of December 7, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 686." (*See Exhibits, Vol. III, page 1761.*)

MR. ANDERSON: Page 29, Executive Order of January 22, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 687." (*See Exhibits, Vol. III, page 1762.*)

MR. ANDERSON: Pages 29 to 36, Executive Order of January 26, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 688." (*See Exhibits, Vol. III, page 1762.*)

MR. ANDERSON: Page 36, Executive Order of February 5, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 689." (*See Exhibits, Vol. III, page 1777.*)

MR. ANDERSON: Pages 37 to 42, Executive Order of February 26, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 690." (*See Exhibits, Vol. III, page 1778.*)

MR. ANDERSON: Page 42, Executive Order of April 2nd, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 691." (*See Exhibits, Vol. III, page 1788.*)

MR. ANDERSON: Page 42, Executive Order of April 11, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 692." (*See Exhibits, Vol. III, page 1790.*)

MR. ANDERSON: Page 43, Executive Order of April 24, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 693." (*See Exhibits, Vol. III, page 1791.*)

MR. ANDERSON: Page 45, Executive Order of April 24, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 694." (*See Exhibits, Vol. III, page 1793.*)

MR. ANDERSON: Again at page 45, Executive Order of April 24, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 695." (See *Exhibits, Vol. III, page 1794.*)

MR. ANDERSON: At page 46, Executive Order of April 25, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 696." (*See Exhibits, Vol. III, page 1796.*)

MR. ANDERSON: Page 47, Executive Order of May 7, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 697." (*See Exhibits, Vol. III, page 1797.*)

MR. ANDERSON: Page 47, Executive Order of May 9, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 698." (*See Exhibits, Vol. III, page 1799.*)

MR. ANDERSON: Page 48, Executive Order of May 31, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 699." (*See Exhibits, Vol. II, page 1800.*)

MR. ANDERSON: Pages 49 to 53, Executive Order of June 15, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 700." (*See Exhibits, Vol. III, page 1802.*)

MR. ANDERSON: Page 60, Executive Order of August 20, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 701." (*See Exhibits, Vol. III, page 1812.*)

MR. ANDERSON: Page 60, Executive Order of August 29, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 702." (*See Exhibits, Vol. III, page 1813.*)

MR. ANDERSON: Pages 61 to 63, Executive Order of September 12, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 703." (*See Exhibits, Vol. III, page 1814.*)

MR. ANDERSON: Page 63, Executive Order of September 13, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 704." (*See Exhibits, Vol. III, page 1818.*)

MR. ANDERSON: Page 63, Executive Order of September 13, 1918, the same page and date.

Received in evidence and marked "Plaintiff's Exhibit No. 705." (*See Exhibits, Vol. III, page 1819.*)

MR. ANDERSON: Page 64, Executive Order of September 13, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 706." (*See Exhibits, Vol. III, page 1821.*)

MR. ANDERSON: Page 65, Executive Order of September 13, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 707." (*See Exhibits, Vol. III, page 1823.*)

MR. ANDERSON: Page 66, Executive Order of September 13, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 708." (*See Exhibits, Vol. III, page 1825.*)

MR. ANDERSON: Page 67, Executive Order of September 13, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 709." (*See Exhibits, Vol. III, page 1827.*)

MR. ANDERSON: Page 68, Executive Order of September 30, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 710." (*See Exhibits, Vol. III, page 1829.*)

MR. ANDERSON: Pages 68 to 71, Executive Order of November 12, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 711." (*See Exhibits, Vol. III, page 1830.*)

MR. ANDERSON: Page 73, Executive Order of July 15, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 712." (*See Exhibits, Vol. III, page 1837.*)

MR. ANDERSON: Page 73, Executive Order of July 18, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 713." (*See Exhibits, Vol. III, page 1838.*)

MR. ANDERSON: Page 74, Executive Order of July 18, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 714." (*See Exhibits, Vol. III, page 1840.*)

MR. ANDERSON: Page 75, Executive Order of July 18, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 715." (*See Exhibits, Vol. III, page 1842.*)

MR. ANDERSON: Page 76, Executive Order of July 19, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 716." (*See Exhibits, Vol. III, page 1843.*)

MR. ANDERSON: Page 76, Executive Order of July 24, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 717." (*See Exhibits, Vol. III, page 1845.*)

MR. ANDERSON: Pages 77 to 79, Executive Order of July 24, 1918.

Received in evidence and marked "Plaintiff's Exhibit No. 718." (*See Exhibits, Vol. III, page 1847.*)

MR. ANDERSON: Page 80, Executive Order of August 1, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 719." (*See Exhibits, Vol. III, page 1852.*)

MR. ANDERSON: Page 80, Executive Order of August 1, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 720." (*See Exhibits, Vol. III, page 1854.*)

MR. ANDERSON: Pages 81 to 83, Executive Order of August 1, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 721." (*See Exhibits, Vol. III, page 1856.*)

MR. ANDERSON: Page 83, Executive Order of August 12, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 722." (*See Exhibits, Vol. III, page 1860.*)

MR. ANDERSON: Page 84, Executive Order of August 16, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 723." (*See Exhibits, Vol. III, page 1862.*)

MR. ANDERSON: Pages 85 to 87, Executive Order of August 30, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 724." (*See Exhibits, Vol. III, page 1864.*)

MR. ANDERSON: Page 87, Executive Order of September 21, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 725." (*See Exhibits, Vol. III, page 1868.*)

MR. ANDERSON: Page 88, Executive Order of November 25, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 726." (*See Exhibits, Vol. III, page 1871.*)

MR. ANDERSON: Page 89, Executive Order of November 25, 1919.

Received in evidence and marked "Plaintiff's Exhibit No. 727." (*See Exhibits, Vol. III, page 1873.*)

MR. ANDERSON: I am willing to agree with counsel now or at any future time that it making

up the record this book of Executive Orders need not be printed. We think the Government can probably supply enough for use in all Courts.

MR. KRESEL: Very well.

MR. ANDERSON: My associate tells me they are not printed, and I am afraid we will have to print them. Most of them are very short.

MR. KRESEL: We will facilitate it as much as possible.

MR. ANDERSON: And the same with respect to the orders of Mr. Polk, pages 90 to 114.

Received in evidence and marked "Plaintiff's Exhibits No. 728 to No 728-Q, inclusive." (*See Exhibits, Vol. III, pages 1874 to 1924, inclusive.*)

MR. ANDERSON: Also the proclamations from pages 114 to 139.

Received in evidence and marked "Plaintiff's Exhibits No. 729 to No. 729-H, inclusive." (*See Exhibits, Vol. III, pages 1926 to 1972, inclusive.*)

MR. ANDERSON: In connection with the messages of the President introduced, I desire to introduce three additional messages of the President, and I am perfectly willing to stipulate these need not be printed in the record, because I think they are probably available in public documents. The first is the message of April 3rd, 1917, I think that is the date on which he addressed Congress recommending the declaration of war.

MR. KRESEL: April 6th.

MR. ANDERSON: April 6th was it; I thought the declaration was the 6th and he made the address on the 3rd. But, anyhow, I ask that the record be corrected if it be a different date.

Received in evidence and marked "Plaintiff's Exhibit No. 730." (*See Exhibits, Vol. III, page 1979.*)

MR. ANDERSON: The message of December 4th, 1917.

Received in evidence and marked "Plaintiff's Exhibit No. 730½." (*See Exhibits, Vol. III, page 1991.*)

MR. KRESEL: I wonder what there is in those messages that bears upon this case. Your Honor will recall the two messages I put in had a direct bearing on it, and I read a portion.

MR. ANDERSON: I could point it out, but I do not want to go into the argument if I can help it, because I am trying to get through as rapidly as possible.

THE COURT: Can you indicate the purpose without going into it?

MR. ANDERSON: It is this. I think this case will have to be argued against a very broad background. It is contended here that the President approved this sale. In my view I can take the record of the addresses of the President and his public communications, put them side by side with this transaction, and demonstrate to this Court that that would have been impossible without charging the President with a gross inconsistency. Of course, therefore, it is all the more important, in view of the relationship which here existed and the delicate questions which arise as to the President at that time charged with these great duties, that we should have the surrounding facts and circumstances of this case as fully developed as possible, and I think when I come to argue this case I can demonstrate the papers I am now putting in are papers which should be considered as the background against which the picture must be painted.

I also offer in evidence certified copy of the communication from the President to the Pope, on the same principle.

MR. KRESEL: From the President to whom?

MR. ANDERSON: From the President to the Pope, an official communication.

MR. KRESEL: To the Pope?

MR. ANDERSON: To the Pope of Rome, a public address on the objects of America and its purposes in the war, in a reply to the Pope's communication suggesting a peace.

MR. KRESEL: I can not conceive, your Honor, how anything that the President said to the Pope of Rome can have any bearing on the disposition of these patents. I know your Honor's rule has been very liberal about admitting documents, and I assume that under that rule this will go in, but I can not let it go in without at least registering my objection thereto.

MR. ANDERSON: It is a certified copy.

THE COURT: I assume the basis for that, Colonel Anderson, is that that is an official utterance which as interpreted by you is in conflict with the contentions of the defendant.

MR. ANDERSON: In essential features and particulars in conflict with the transaction here involved, sir.

THE COURT: And the date is what?

MR. ANDERSON: The date is just prior to this transaction.

MR. KRESEL: What is the date there?

MR. ANDERSON: It is in the late summer of 1918, I think. Your Honor will recall the Pope addressed a communication to all the warring nations suggesting peace, and the President made that reply, which is probably the great classic of the war.

MR. KRESEL: It is August 1st, 1917, Colonel.

THE COURT: My difficulty with all these that were prior to the submission of the Alien Prop-

erty Custodian's report, in February or early in March of 1919, is how those papers are relevant. I will not ask you to discuss it now.

MR. ANDERSON: I hope you won't, because I think I can demonstrate it, and if I can not, there can not be very much harm, and in view of the size of the record anyhow, and at the proper time I will try to demonstrate it.

THE COURT: Admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 731." (*See Exhibits, Vol. III, page 2003.*)

MR. ANDERSON: I now wish to introduce in evidence specifically a copy of the license of November 20, 1919, to the Textile Alliance, embodied in a communication by The Chemical Foundation, to be read as Plaintiff's Exhibit No. 732.

Received in evidence and marked "Plaintiff's Exhibit No. 732." (*See Exhibits, Vol. III, page 2007.*)

MR. ANDERSON: In the same connection, I offer the list of patents thereto annexed, as Plaintiff's Exhibit No. 732-A.

Received in evidence and marked "Plaintiff's Exhibit No. 732-A." (*See Exhibits, Vol. III, page 2009.*)

MR. ANDERSON: Also a letter of December 9, 1919, as Plaintiff's Exhibit No. 732-B.

Received in evidence and marked "Plaintiff's Exhibit No. 732-B." (*See Exhibits, Vol. III, page 2010.*)

MR. ANDERSON: A letter of December 9th, 1919, as Plaintiff's Exhibit No. 732-C, and an accompanying state of patents, with the last letter as Plaintiff's Exhibit No. 732-D.

Received in evidence and marked "Plaintiff's Exhibits Nos. 732-C and 732-D." (*See Exhibits, Vol. III, pages 2001, 2002.*)

MR. KRESEL: Who vouches for the correctness of these copies?

MR. GALLOWAY: They are taken from your files, Mr. Kresel.

MR. ANDERSON: I will be very glad to stipulate, if they are not correct, correct copies may be substituted. I did not want to ask for the original and substitute it.

MR. KRESEL: You say you took this from our files?

MR. GALLOWAY: You gave us your license and we had it copied. Those are from your files. You see, it is accepted at the bottom, by the act of the Secretary of the Textile Alliance.

MR. KRESEL: Your Honor, I have had no opportunity to read this. I can not see where this is rebuttal, Colonel.

THE COURT: I thought these were reserved papers.

MR. KRESEL: I know of no such reservation.

MR. ANDERSON: On the contrary, Mr. Kresel, you recall I asked you to produce all your licenses before I closed my case and you said you would put on Mr. Garvan, who would produce the licenses and a list of analysis of the licenses, showing a schedule thereof, with certain facts in connection with it.

MR. KRESEL: Which he did.

MR. ANDERSON: And I reserved, as I understood our arrangement, the right then to deal with the question of these licenses or put any of them in evidence deemed desirable. I did not put them in evidence. I have had them checked over and I think the statement is sufficient, with the exception of these two, and I specially asked for this one when Mr. Garvan was on the stand. I thought I had introduced this before, but I did not.

THE COURT: This license is what?

MR. ANDERSON: The one is to the Textile Alliance on the importation of dyes under the patents. The other that I now want to offer in evidence—I have already offered that, the license of The Chemical Foundation to the Atmospheric Nitrogen Company of Syracuse, New York, dated July 24th, 1920.

THE COURT: Are they offered in rebuttal or as part of your case in chief?

MR. ANDERSON: This is offered in rebuttal on the question of the Haber patents, and I could not put it in otherwise.

THE COURT: What are the relevant portions?

MR. KRESEL: How is it rebuttal?

MR. ANDERSON: If your Honor recalls the very elaborate evidence taken on the question of these Haber patents and their alleged invalidity——

THE COURT: No, not invalidity.

MR. ANDERSON: I mean their alleged imperfections; I will put it that way.

MR. KRESEL: Not even that; as to the Haber patents.

MR. ANDERSON: I did not in the original case introduce any evidence on that subject.

MR. KRESEL: Yes, you did; you put Dr. Holdermann's testimony in.

THE COURT: The only evidence that I know of that I now recall that was introduced by the defense was with respect to their value and not to their validity. My recollection is that Dr. Holdermann's testimony went to their value, and that was met or attempted to be met, whichever it may prove to be, by certain evidence offered by the defendant. Just what is this evidence and how is it rebuttal?

MR. ANDERSON: Your Honor will recall that

The Chemical Foundation originally licensed the Semet-Solvay Company under the Haber patents.

MR. KRESEL: No, that is not the fact.

THE COURT: The Federal Trade Commission.

MR. KRESEL: The Federal Trade Commission did that. You said The Chemical Foundation.

MR. ANDERSON: I meant the Federal Trade Commission. And then subsequently The Chemical Foundation licensed the Atmospheric Nitrogen Company under the Haber patents, which, on Mr. Garvan's testimony, appeared to be a license for $2,500 and certain conditions.

I do not think that the conditions stated in Mr. Garvan's statement are in anywise complete as to the terms of that license. I do not mean to say that they were not intended to be complete so far as he thought them material; but I think the terms of the license are very important, and the list of the patents attached thereto is very important.

Therefore I would like to put this in; I have offered this license in evidence to cover that situation. I think it is clearly rebuttal.

MR. KRESEL: Colonel, it is not rebuttal; but I will withdraw any objection.

MR. ANDERSON: Very good; then we are through with that.

THE COURT: There being no objection, it will be admitted.

Received in evidence and marked "Plaintiff's Exhibit No. 733." (*See Exhibits, Vol. III, page 2014.*)

MR. ANDERSON: If your Honor will recall, in the evidence in chief I offered a certified copy of opinion by Judge Julius Mayer in the case of Metz against Garvan. Mr. Kresel stated at the time that it was reported. I can not find that the

opinion is reported; and if it is not officially reported, I would like very much to put a copy in evidence. I would have offered it at that time, and did offer it; but I withdrew it on his statement that it was reported.

MR. KRESEL: That is quite true. I do not know; I can not give you the reference. But even at that I do not think that the opinion should go in evidence. If the Court desires it for reference, well and good; but to make it a part of the record is not proper.

THE COURT: You may make it a part of your briefs, but it has no place among the exhibits.

MR. ANDERSON: Very good, sir. We will then use it in a brief instead, so long as I can use it.

At page 3473 of the record, I requested Mr. Thompson then on the stand to furnish me a list of prices of certain dyes in 1913. At page 3487 of the record I requested Mr. Hobbs to furnish me the prices of certain dyes in 1913. At page 3487 of the record, I requested Mr. Hobbs to send me labels from containers of dyes. At page 3507, I requested Mr. Cheney to send me a list of the dyes used by him; also labels on dye packages. At page 3508 I requested Mr. Cheney to furnish me prices of dyes used by him in 1913. These gentlemen have not sent in this information; and if it is not available, I should like to reserve the right to file it later.

MR. KRESEL: Wait a moment. I think I have some of this information for you. What did you ask of Mr. Thompson?

MR. ANDERSON: A list of prices of certain dyes in 1913. He gave the prices now, but I wanted them for then.

MR. KRESEL: Here is a list of dyestuffs purchased from Germany in 1921 and in 1913. Is that what you want?

MR. ANDERSON: Yes.

MR. KRESEL: Here is a list purchased in 1922. That is all I have from Mr. Thompson. Isn't that all you asked for?

MR. ANDERSON: I think that is what I asked for from Mr. Thompson, yes. The others are from Mr. Hobbs and Mr. Cheney.

MR. KRESEL: With reference to labels, this letter from Mr. Imbrie, who, speaking for Mr. Thompson, says:

> "I have communicated with our several plants where the dyes are used and have telegrams today from all of them to the effect that they find no reference to Chemical Foundation licenses on any color packages received by us."

The letter also says:

> "Mr. Thompson was asked by Colonel Anderson to ascertain whether any of the barrels or packages containing American dyes purchased by us bore any marks or labels to indicate that the colors were made under Chemical Foundation licenses."

What do you want from Mr. Hobbs?

MR. ANDERSON: I wanted a statement of the cost.

MR. KRESEL: Here is a statement of prices from 1913 to 1918. With reference to labels, Mr. Hobbs writes:

> "We have also examined all of the dyestuffs now in stock and there are no labels on the barrels or containers that show any reference to their manufacture or sale under any patent rights controlled by The Chemical Foundation."

Here is a statement from Cheney Brothers with reference to the German colors used during 1922. I think that is all you asked for.

MR. ANDERSON: He did not send me the prices, did he?

MR. KRESEL: No. This is a list of dyes used. That is all I have.

MR. ANDERSON: I would like to offer in evidence the statements which have been handed me by counsel: First, the one from Cheney Brothers, of German colors used in 1922.

Received in evidence and marked "Plaintiff's Exhibit No. 734." (*See Exhibits, Vol. III, page 2024.*)

MR. ANDERSON: Chief colors of American manufacture in 1921 with prices.

Received in evidence and marked "Plaintiff's Exhibit No. 734-A." (*See Exhibits, Vol. III, page 2025.*)

MR. ANDERSON: Dyestuffs purchased from Germany in 1921, with prices.

Received in evidence and marked "Plaintiff's Exhibit No. 734-B." (*See Exhibits, Vol. III, page 2025.*)

MR. ANDERSON: Additional testimony furnished by Mr. Franklin W. Hobbs, President of the Arlington Mill.

Received in evidence and marked "Plaintiff's Exhibit No. 734-C." (*See Exhibits, Vol. III, page 2026.*)

MR. ANDERSON: Mr. Kresel, you said you had the books or accounts of the Calco Chemical Company on the question of the cost of research.

MR. KRESEL: No, I beg your pardon. I did not say that I had the books of account. You asked for their accounts. I asked them to produce them. I have not seen them. They have some books here. I told Mr. Galloway this afternoon, so as to put him in touch with these people. What they have, I do not know.

MR. ANDERSON: I would like to see what they have.

MR. KRESEL: Go ahead. Whom do you want?

MR. ANDERSON: I do not know who has them.

MR. KRESEL: Here is Mr. Berry. You can call him.

MR. ANDERSON: Will you take the stand, please?

GEORGE A. BERRY.

GEORGE A. BERRY was called as a witness on behalf of the plaintiff, in rebuttal, and being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By MR. ANDERSON:

Q. 1. What is your name and where do you live?

A. My name is George A. Berry. I live at Bound Brook, New Jersey.

Q. 2. What is your position with the Calco Chemical Company?

A. I am Vice-President and General Manager.

Q. 3. I requested the counsel for the defendant to have produced here the books of the Calco Chemical Company, showing the amounts of their expenditures for research in the development of various drugs as to which Dr. Crossley had testified. Have you had that request communicated to you?

A. Yes, it was communicated to me Saturday.

Q. 4. Have you those original books in your possession?

A. I got together as much of my organization Sunday as I could in the short space of time, and I prepared an abstract from the books as far as time permitted. I have some information with me, but not all.

Q. 5. You have not all the information with you? Have you the books with you?

A. No, I have not the books with me.

Q. 6. This is data you made up and is not complete?

A. It is data abstracted from the books by the Company's controller.

Q. 7. But it is not complete?

A. It is not complete in the division of the research expenses as between the items in question and the other research expenditures of the company.

Q. 8. Did you make up that data yourself?

A. Well, I supervised the making of it, yes, sir.

Q. 9. Did you check it against the books yourself?

A. No, not personally.

Q. 10. I think that would be useless, sir. It is useless to produce it.

A. I might say that in sufficient time we can produce the original books of the company and the men who are responsible for the entries, who can swear to them.

Q. 11. You can not, of course?

A. I can in that the Accounting Department of the company is under my jurisdiction and under my instructions. I know what they have done and why and how.

Q. 12. But you did not, as I understand, check this data back against the books as to divisions or distributions?

A. Not item by item. It involves something in excess of 5,000 items.

Q. 13. And you therefore cannot of your own knowledge say that it is true?

A. No, sir.

MR. ANDERSON: In the circumstances, I will not ask for the production of the data, because I could not admit it in evidence.

MR. KRESEL: Who could not admit it?

MR. ANDERSON: I could not.

MR. KRESEL: In other words, you call a witness, you find out if he knows the fact, and then you won't take it from him.

MR. ANDERSON: I certainly will not, because I want the data from the original source.

MR. KRESEL: That is all.

MR. ANDERSON: I called for the production of the books of the company showing these expenditures, and they have not been produced, and I will not take secondary evidence on that subject.

MR. KRESEL: That is all, sir.

(Witness excused.)

MR. ANDERSON: Would your Honor take a recess for about five minutes? I think I can probably then promptly conclude this case.

THE COURT: Recess for five minutes.

AFTER SHORT RECESS (9.30 P. M.)

MR. ANDERSON: May it please the Court, upon consideration yesterday of the testimony, the Government reached the conclusion that while paragraph thirty-nine of the Bill was drawn upon the information before it, yet the testimony is inconsistent with that information, and therefore it is proper that an application should be made for an amendment of the Bill, the formal amendment of the Bill to conform to the facts as appear in the testimony, under Rule 19.

I therefore wish to move the Court for leave to amend the Bill, paragraph 39, beginning with the words, "Complainant is informed, believes and therefore avers," in lines 16 and 17 on page 54, and continuing to the end of said paragraph, and in place thereof, insert the following:

"Complainant is informed, believes, and therefore avers that the patents and other rights purported and attempted to be sold, assigned and transferred by the said instrument dated the 27th day of April, 1921, did not relate to the objects and purposes of the said Chemical Foundation, Incorporated, as expressed and defined in its Charter; that the alleged purchase price named in said instrument and paid by the defendant to the Alien Property Custodian——"

THE COURT: Won't you begin again, Colonel Anderson, you want to strike out all the 39th paragraph?

MR. ANDERSON: Beginning with the words "Complainant is informed, believes and therefore avers," in lines 16 and 17 on page 54.

THE COURT: I have it.

MR. ANDERSON: And continuing, and to substitute for that last paragraph as I recall it in the Bill—I have not got it before me at the moment—this language:

"Complainant is informed, believes and therefore avers that the patents and other rights purported and attempted to be sold, assigned and transferred by the said instrument dated the 27th day of April, 1921, did not relate to the objects and purposes of the said Chemical Foundation, Incorporated, as expressed and defined in its Charter; that the alleged price named in said instrument and paid by defendant to the Alien Property Custodian, as aforesaid, was fixed and determined arbitrarily and had no relation to the real value thereof; that no effort or attempt was made to ascertain or determine what in fact, was the real value of said patents and other rights; that said alleged purchase price was inadequate and greatly less than the real value of said patents and other rights;

and that the real purpose for which the said patents and other rights were attempted to be assigned and transferred to defendant was to enable a concern called The Norma Company of America to obtain from defendant, for a nominal sum, the right or license to use said patents and other rights in connection with the business being conducted by it.

"Complainant is informed, believes and therefore avers that no consideration whatever was paid by defendant to the Alien Property Custodian for the said alleged and attempted sale, assignment and transfer of November 5, 1921, nor was any consideration received by the Alien Property Custodian from anyone else therefor, and that said instrument was made, executed and delivered without any consideration whatever.

"Complainant therefore avers that these alleged instruments of alleged sale, assignment and transfer were irregular and contrary to law, and were and are, in all respects null and void and of no effect in law or equity."

It seemed to me the duty of the Government in view of the evidence developed here, to propose that amendment to the Bill, to make it conform to the evidence. As I have said, when the Bill was drawn, it was drawn upon information that was believed to be supported by the understanding of the persons from whom the information was derived, and by their statements, but evidently there was a mistake on the part of those persons who acquired the information in some respects, and therefore I feel that it is the duty of the Government to propose that amendment, although it may or may not be material.

THE COURT: Is there objection?

MR. KRESEL: There is a very serious objec-

tion, your Honor. Before arguing the objection, I think the defendant is entitled——

THE COURT: I do not care for any argument. I am ready to rule on it now, unless you want to argue it on both sides.

MR. KRESEL: I do not.

THE COURT: The motion is denied for the reason that the Bill is verified by the very person who was supposed to have knowledge or information with respect to the facts set forth in that particular paragraph. The amendment of the Bill at this stage of the case is in the discretion of the Court, and I think it would be an abuse of discretion to permit that paragraph to be amended, it having been verified by the individual upon whose subsequent testimony the proposed amendment is now based. The motion is denied.

MR. ANDERSON: I respectfully defer to your Honor's views, since it is entirely in your Honor's discretion; but I felt I ought to make the motion. With that statement and with one or two reservations which appear of record, the Government closes its case.

MR. KRESEL: May I know what those reservations are?

MR. ANDERSON: I could not possibly state those now. If they are not of record they are not made. As we progressed, there were certain other papers to be filed from time to time, if produced, and if they appear of record as having been reserved, of course, it is right; otherwise, I make no reservations at this time.

THE COURT: Do you have those papers in mind?

MR. ANDERSON: If your Honor please, I haven't anything in mind at the moment. I do not recall anything that was reserved.

I understand from my associates that Dr.

McCoy was to file certain papers and there was a reservation that Dr. Gibbs, if he found certain papers, would send them to counsel and myself. Those are the matters that immediately occur to me, and as the record went on there were things reserved to be filed later, if obtained. That is what I was referring to.

THE COURT: Those records to be produced by Dr. McCoy were given an exhibit number and were to be supplied within a reasonable time.

MR. KRESEL: As far as Dr. Gibbs is concerned, I do not understand that he is at liberty to file anything. My understanding is that he thought he had some paper which would enable him to definitely fix the date of his conversation with Mr. Garvan.

THE COURT: And it was to be admitted by stipulation of counsel, as I recall it, in the event that it was deemed relevant or material.

MR. KRESEL: Yes; it was to be submitted to counsel first.

THE COURT: And filed at the time of argument.

MR. KRESEL: Exactly.

MR. ANDERSON: I think that was my understanding, sir, as I recall it; but I merely want in closing the case not to appear to waive whatever reservations there were on the record which I can not recall.

THE COURT: Then you now close without reservation, save that you may by stipulation admit the memorandum or memoranda that may be filed by Dr. Gibbs with respect to the time of his conversation with Mr. Garvan?

MR. ANDERSON: So far as Dr. McCoy's papers are referred to——

THE COURT: They are in and can be supplied.

MR. ANDERSON: So far as I now recall, those were the only two reservations that we made.

THE COURT: Do you close on both sides?

MR. KRESEL: No, your Honor, not on my side. There are one or two things that I desire to bring to the attention of the Court and then I have a witness whom I want to call for one question.

To begin with, your Honor, last Saturday, Colonel Anderson—I do not know in what connection—spoke of my having made an announcement that I was going to call Mr. Hoguet as a witness and that I had explained to Colonel Anderson the reason why I had not called him, which reason he said was entirely satisfactory to him, but which reason did not appear upon the record. I think it is due to the Court and counsel that the record should be entirely clear upon the subject.

To begin with, I do not recall what Colonel Anderson refers to as my announcement of calling Mr. Hoguet. It may be that in my opening statement I said that. If I did, of course the record will show it. I do not recall. At all events, the fact is that Mr. Hoguet was under subpoena by the Government for several weeks and was in attendance here waiting to be called. Whether he was ever formally discharged from that subpoena, I have no knowledge. Certainly he was not discharged with my consent or with my knowledge.

I did intend to call Mr. Hoguet, but last Wednesday, I think, I learned for the first time that he was ill and could not appear. Immediately upon learning that, I notified Colonel Anderson. I showed Colonel Anderson a letter from Mr. Hoguet, and also a telegram from his doctor, stating that he was in bad health and could not be a

witness. Colonel Anderson, of course, said that was all right under the circumstances. I think that that ought to appear upon the record, because I think your Honor is entitled to know why Mr. Hoguet was not called as a witness.

I think, too, it is proper that the Court should know, as I think counsel will concede, that Mr. Hoguet has been and is now in the employ of the Government. He has been and is now a special assistant to the Attorney General in the matter of some patent litigation, and my understanding is that he is directly under the supervision of Mr. Knight, who has charge of that work for the Attorney General. I say that both angles of that matter it is proper that the Court should have before it.

I have here Mr. Hoguet's letter. I have his physician's telegram to me. I do not see the necessity of putting them in evidence, but if Colonel Anderson desires, I shall be very glad to do it.

Mr. Anderson: In view of the statement of counsel, first I think counsel will concede that he did state to me personally, and I understood him to say in open Court, that the four gentlemen I named would be called.

Mr. Kresel: I do not recall it, but Colonel, if you say it, I will not deny it.

Mr. Anderson: Well, we discussed it several times. I had Mr. Hoguet summoned as a witness and I did not put him on the stand because I understood he would be called by the defendant and I thought he was properly a defendant's witness. I do not know whether he has been released from subpoena. He left here several weeks ago. I have not kept up with that detail of this case.

Mr. Kresel: I knew nothing about it.

MR. ANDERSON: The fact is that I expected him to be called until you showed me that letter and telegram.

MR. KRESEL: Mr. Clerk, if he has been released, will not your records show?

THE CLERK: He has never been formally discharged.

MR. ANDERSON: If he has not been, he should be. I had intended to call Mr. Hoguet, but as I understood he was to be put on by the defense, I did not call him. I could not put in some papers this evening for the reason that he had not been called. If there was any misunderstanding or anything of that kind, then I am sorry. I thought that subject was quite clear.

Since counsel has made the statement, I might say that Mr. Hoguet was appointed as Special Assistant to the Attorney General in June, 1919. I think he has been handling patent litigation from time to time since then and is doing so now. I am perfectly willing to concede that fact, the date of the appointment, and that he is still handling certain patent cases for the Government.

MR. KRESEL: Have you got the date?

MR. ANDERSON: The date is in the paper I showed you just now. You suggested I should not put in the appointment, because we could agree on the record.

MR. KRESEL: That is right.

MR. ANDERSON: He was appointed by Mr. A. Mitchell Palmer on the 29th day of September, 1919. I thought it was June.

I think in view of the circumstances and the statement made by counsel, that it would be well to have the letter and telegram go in evidence.

MR. KRESEL: I will be very glad to offer them. I offer the letter from Mr. Hoguet, dated July 17, 1923.

Received in evidence and marked "Defendant's Exhibit No. 375." (*See Exhibits, Vol. V, page 3490.*)

MR. KRESEL: I offer in evidence telegram dated July 18, 1923, signed "J. A. McCreary, M.D."

Received in evidence and marked "Defendant's Exhibit No. 376." (*See Exhibits, Vol. V, page 3491.*)

MR. KRESEL: Before the case closes, your Honor, I should ask your Honor to direct now that any applications of exhibits may be eliminated with the consent of both sides, without making a special application each time to the Court. I think that will facilitate our printing of the record and of the exhibits.

THE COURT: It is so ordered; and all exhibits not expressly or specifically admitted are now admitted as if each had been so admitted.

MR. KRESEL: Your Honor, we have prepared a memorandum with reference to the dye legislation by Congress.

THE COURT: Do you want to put that in here or do you want to put it in the briefs? It has really no particular place here any more than, I think, the opinion. It is a summary.

MR. KRESEL: I think that is a very good suggestion. We can use it in our brief without putting it in evidence. That is all right, your Honor.

MR. ANDERSON: I do not know the source of that information.

MR. KRESEL: It is in public acts.

MR. ANDERSON: Oh, legislation?

MR. KRESEL: Yes.

MR. ANDERSON: Wherever it is an act of Congress, of course, it can be used in briefs.

THE COURT: If you prefer to have it an exhibit, of course, you may.

MR. KRESEL: We were quite willing to have it in as evidence, but the Government did not have any means of checking up our memorandum. I was going to suggest that it might go in evidence subject to correction. But I really do think that we can use it in our brief without having it in evidence.

I am sorry, your Honor, that the translation of the French document is not yet completed. We have had some difficulty in getting a proper translation. Of course, before it can be admitted, it has to be passed on by the Government. I should like, therefore, to reserve the right to submit to the Government, as speedily as may be, a complete translation of that French document and then file it with the Clerk; and the complete translation may take the exhibit number of the partial translation in evidence.

THE COURT: So ordered, without objection.

MR. KRESEL: Your Honor directed that we furnish information as to the exact date of the publication of the book entitled, "Coal Tar and Dye Intermediates," by E. de Barry Barnett, an extract from which was used upon Dr. Crossley's examination. Your Honor will recall that the book itself showed that it was published in 1919; but the exact date of publication did not appear.

THE COURT: The English book?

MR. KRESEL: Yes, your Honor. We have made inquiry from the publishers, and the information is that it was published in January, 1919. That, of course, is subject to correction, but that is the best information we could get.

Col. Anderson, is there any objection to stipu-

lating that none of the patents in question here have been adjudicated prior to April 10, 1919?

MR. ANDERSON: Mr. Kresel, I would rather not stipulate that, because I do not know a thing about it. There may have been a number of them adjudicated, or questions decided upon them, and I do not want to bind the Government by a stipulation. If I knew the fact, I would not hesitate, sir.

MR. KRESEL: Let it pass.

I offer in evidence cablegram from Mr. Garvan to Bradley Palmer, which is one of the series of correspondence that passed between the Secretary of State's office and Mr. Bradley Palmer and Mr. Garvan at the time of the Peace Conference. It is dated April 12, 1919. It is one of those that was produced for us from the office of the Secretary of State.

MR. ANDERSON: I would have to object to that, sir, on the ground of immateriality and irrelevancy, and further that it has been available for some days, and I think it should have been introduced before we closed our case.

MR. KRESEL: It was not given to us until after the plaintiff's case had been closed, until after the defendant's case had been closed, and you were on your rebuttal.

MR. ANDERSON: We have some of those telegrams and letters and papers that we probably would have wanted to put in if the correspondence had been put in; but it was not put in, and we had no notice that it was going to be put in.

MR. KRESEL: Had no notice that what was going to be put in?

MR. ANDERSON: If this correspondence had been put in, we would probably want to put in other correspondence.

MR. KRESEL: I have put in one cablegram, and it was not furnished to us until after our case was closed.

MR. ANDERSON: We should at least have been given notice of a purpose to put it in.

THE COURT: Was it called for?

MR. ANDERSON: It was called for and we gave it to these gentlemen some days ago.

MR. KRESEL: Last Friday we received these cables.

MR. ANDERSON: We began our rebuttal on Thursday, and as soon as we got them from Washington, we gave them to these gentlemen.

THE COURT: Applying strict rules, as you are furnishing them, you may put it in evidence. Those rules have not been enforced at any stage of this case. There was no opportunity in the regular order of the procedure for the defendant to present it during rebuttal. Have you any specific communications that you want to present as offsetting the effect of his cable?

MR. ANDERSON: May I see the cable that was put in? (Examines cable offered by Mr. Kresel.)

I will object to this telegram as immaterial and irrelevant in any event. It is not a telegram of the Government of the United States. It is a telegram from Mr. Garvan to Mr. Bradley Palmer. I think if these telegrams are going in, they ought all go in.

THE COURT: I do not think that follows, Colonel Anderson. In so far as they are relevant——

MR. ANDERSON: I would like your Honor to read this telegram (handing to Court). I do not want to read it because I do not want it to go on the record. But I would very much like your Honor read it, as I do not know on what possible

theory that can be put in evidence by the defense in this case.

THE COURT: Mr. Kresel, it seems to me that it antedated April 12th. It is two days after the first assignment. It would not help me.

MR. KRESEL: The Exhibit is withdrawn.

Dr. Stieglitz has read over his testimony in Chambers, your Honor, and has certain corrections that he desires to make. He has written them out on two sheets of paper. I do not want to take the time to read them into the record.

THE COURT: Have you submitted them to Col. Anderson?

MR. KRESEL: No, sir. May they not be given to the stenographer and the stenographer directed to correct them accordingly?

Would you like to see them?

MR. ANDERSON: Without seeing them, I do not know how far I would object; but if they in any way enlarge or change the testimony, I would object.

THE COURT: You may examine them now and take as much time as necessary for that purpose.

(Mr. Anderson examines paper.)

MR. ANDERSON: There are certain of these corrections, sir, which are merely verbal and immaterial. There are others on which I will have to read the context a little more carefully. I think I would like to ask Mr. Knight if he would do it whilst I proceed with the remainder of the case.

MR. KRESEL: All right, but we will finish it before we leave tonight. Mr. Garvan, will you take the stand, please.

DEFENDANT'S REBUTTAL PROOFS.

FRANCIS P. GARVAN.

FRANCIS P. GARVAN was recalled as a witness in sur-rebuttal, on behalf of the defendant, and having been previously duly sworn, testified further as follows:

DIRECT EXAMINATION.

By MR. KRESEL:

Q. 1607. Mr. Garvan, last Saturday Dr. Gibbs was a witness here and he testified about an alleged conversation that he had with you. I shall read to you two or three sentences, which constitutes the testimony given by Dr. Gibbs in that connection.

At page 4661 the following testimony was given by Dr. Gibbs:

> "Q. 70. Just what you told Mr. Garvan. It does not matter what Mr. Garvan said to you, but state what you told him about salvarsan?
>
> "A. I told Mr. Garvan that I could not substantiate the contention that the German patents were unworkable from the experience that my laboratory had had with salvarsan.
>
> "Q. 71. Did you state anything further; did you tell him what that experience was?
>
> "A. I possibly stated that our experiments" —and then he was interrupted by the Court, who said, "No, do not guess." And finally the question was repeated as follows:
>
> "Q. 72. Do you remember whether you did state to him the result of your laboratory work?
>
> "A. I stated that we had made salvarsan in the laboratory under the German patents. I possibly stated——"

And then he was again cautioned against using the word "possibly," and then this question was put to him:

"Q. 73. As I understand it, the two things you are prepared to say you did say to Mr. Garvan, on which your recollection is definite, is that you could not sustain the suggestion that the German patents were unworkable because of your experience, the experience of your laboratory in the making of salvarsan under the German patents, and that you had made salvarsan under the German patent in that laboratory or that it had been made in the laboratory?

"A. Yes."

Then upon cross-examination he was again asked about this conversation with you, and his testimony upon the subject was this—I read from page 4675:

"XQ. 140. Well, go on; I have been asking you to give it to us?

"A. Mr. Garvan introduced the subject of the American patents that were German owned, and while I can only remember in a very sketchy way what he said, the substance of it is the same as he has made in speeches on many occasions, referring to the non-workability and questions of seizure and use in this country and general questions of that description——"

Then he is asked to be more specific about it, and his answer is this:

"A. That he had understood that these patents were designed to conceal information, and that they were taken out for the purposes of obstruction of American industries, and that possibly—I guess he stated pretty positively that most of them were not workable, or words to that effect. I cannot give it much more in detail; but that was the reason for my——"

And then he went off into something else.

As to the date of this alleged conversation, Dr. Gibbs has stated that he was positive that it was either on April 10th or prior to April 10th, 1919, but that he

did not have any conference with you subsequent to April 10th, 1919. Now, did you in the year 1919 have any conferences with Dr. Gibbs?

A. I did.

Q. 1608. Did Dr. Gibbs at any of those conferences say to you, either in words or in substance, that in his laboratory, that is the color laboratory or anywhere else, either he had made, or anybody under his supervision had made salvarsan?

A. He did not.

MR. KRESEL: That is all.

MR. ANDERSON: You can stand aside.

(Witness excused.)

MR. KRESEL: Defendant rests.

THE COURT: You rest on both sides.

At the close of this case, I want to thank counsel on each side for their patience and uniform courtesy throughout the trial. I also want to thank you, Mr. Smart, and your assistants for the thorough manner in which you have reported these proceedings.

MR. KRESEL: Will your Honor permit me, on behalf of my associates, and on behalf of the defendant, to express our deep appreciation of the uniform courtesy that your Honor has extended to us, and for the treatment that counsel for the defendant have received at the Court's hands.

Personally I am a stranger in this jurisdiction. I have had some limited experience in the trial of cases, and I say this full-heartedly, that I have never appeared before a Court, either State or Federal, where counsel have been treated as counsel have been treated in this case. I deem it a great pleasure to have been before your Honor, and I trust that I shall pretty soon have another occasion to be before you.

MR. ANDERSON: The counsel for the Govern-

ment desire to thank the Court for the very courteous remarks addressed by the Court to counsel in this case. They desire also to express their appreciation of the courtesy and consideration of the Court toward counsel for the Government during the trial. We recognize the fact that this long and tedious trial has been a severe tax upon the Court as it has been to counsel. It is hoped that any unpleasant incidents which may have occurred may be forgotten and only those which are pleasant may be remembered.

(Whereupon, at 10.20 P. M., Standard Time, on Monday, July 23, 1923, the case was closed.)

ORDER APPOINTING STENOGRAPHER.

(Filed May 7, 1923.)

And now, to wit, this seventh day of May, A. D. 1923, it appearing to the court from the bill of complaint and answer filed in the above entitled cause that it is necessary that the testimony adduced at the trial of this cause in open court be taken down in shorthand and transcribed, it is ORDERED by the court that William F. Smart be and he hereby is appointed official stenographer in this cause to take down such testimony and furnish a transcript or transcripts thereof, his fee for taking such testimony and furnishing a transcript thereof to the court to be ultimately taxed as part of the costs of this cause. The expense of taking a deposition and furnishing a transcript or transcripts thereof shall be advanced by the party calling the witness.

(Sgd.) HUGH M. MORRIS, *J.*

ORDER FOR PRINTING RECORD.

(Filed July 23, 1923.)

AND Now, to-wit, this twenty-third day of July, A. D. 1923, after hearing counsel for the parties in the above cause regarding the printing of the record herein, for use in this and any appellate court, it is

ORDERED BY THE COURT that a transcript of the record be forthwith prepared and printed as reported, including statements of counsel at opening of and during the trial, and without reducing the same to narrative form, under the supervision of the clerk, in such manner and form that the same may be available for use in any appellate court;

AND IT IS FURTHER ORDERED BY THE COURT, counsel of record for the parties consenting in this behalf, that the expense of printing one hundred copies of the said transcript shall be advanced from time to time and borne in equal amounts by the plaintiff and defendant, and form part of the taxable costs of said cause; the costs of additional copies, if any, which may be furnished to the parties respectively, shall be borne by the party or parties receiving such additional copies.

(Sgd.) HUGH M. MORRIS, *J.*

OPINION OF COURT.

(Filed January 3, 1924.)

By this suit in equity instituted by the United States of America against The Chemical Foundation, Incorporated, the plaintiff seeks the annulment of sales of property purporting to have been made by the plaintiff to the defendant. The property sold consisted mainly of U. S. letters patent, copyrights and trademarks pertaining to chemicals and pharmaceuticals. At the outbreak of the war it was owned by subjects of Germany. During the war it was seized as enemy property by the Alien Property Custodian. The President, stating the reasons therefor in the public interest, authorized the Custodian to sell the same to the defendant at private sale upon such terms and conditions as to the Custodian might seem proper. The sales were made in the years 1919, 1920 and 1921. Conditions of sale were that the property should be held in a fiduciary capacity for the Americanization of such industries as might be affected thereby and for the advancement of chemical and allied science and industry in the United States; that non-exclusive li-

censes, only, should be granted; that the United States should receive free licenses; and that other licenses granted should be upon reasonable and equal terms without advantage as between licensees. The monetary consideration paid was approximately $271,000.

The plaintiff challenges the power to make the sale. It asserts, and the fact is not disputed, that the price for which the property was sold was far less than the property was worth to the Germans from whom it was seized. It asserts that the conditions of sale were partially destructive of the selling value even to American citizens. This is likewise conceded. It contends that no authority existed for selling enemy property for less than its fair monetary value and that conditions of sale destructive of its fair monetary value, though in the public interest and even though the independence of the United States might have depended thereon, could not be imposed. (R., pp. 3041-3049.) The defendant takes the position that in the disposition of enemy property there was not only a power but also a primary duty to consider and safeguard the public interest; that the President and the Custodian were clothed with this power and burdened with this duty and that, in the absence of fraud, their acts done in the exercise of this power and in the performance of this duty are not subject to judicial review. There is thus presented the broad question of power with respect to the seizure and sale of enemy property.

Enemy property found upon land in the United States cannot be condemned as enemy property without an act of Congress. A declaration of war is not such an act. Brown v. United States, 8 Cranch 110. The Trading with the Enemy Act (40 Stat. 411), approved October sixth, 1917, as amended in March and November, 1918 (40 Stat. 460 and 1020) is here relied on. Whether considered as originally passed or as

amended that act is strictly a war measure finding its sanction in the constitutional provision, Art. 1, Sec. 8, Cl. 11, empowering the Congress "to declare war, grant letters of marque and reprisal, and make rules concerning captures on land and water." Stoehr v. Wallace, 255 U. S. 239, 241-2; Commercial Trust Co. of New Jersey v. Miller, 281 Fed. 804 (C. C. A. 3) affirmed 262 U. S. 51. We are here concerned with captures on land, only. By section 5 of the act the President is in terms authorized to "exercise any power or authority conferred by this Act through such officer or officers as he shall direct." Section 6 authorized the President to appoint and "prescribe the duties of" an official to be known as the Alien Property Custodian and empowered the Custodian to receive all money and property in the United States due or belonging to an enemy and to hold, administer and account for the same under the general direction of the President and as provided in the act. Section 7(a) imposes upon all persons in the United States the duty of reporting to the Alien Property Custodian the enemy owned property within their control. Section 7(c), as originally passed, authorized the President to require all enemy property to be paid, transferred or delivered to the Alien Property Custodian. An amendment of November 4, 1918, 40 Stat. 1020, makes the provisions of this subsection apply expressly to "patents, copyrights, applications therefor, and rights to apply for the same, trade marks, choses in action, and rights and claims of every character and description" and authorizes the seizure by the Custodian of any property that the President might require to be paid, transferred or delivered to the Custodian.

By an amendment of March 28, 1918, 40 Stat. 460, the fourth paragraph of Section 12 was made to read as follows:

"The alien property custodian shall be vested with all of the powers of a common-law trustee in respect of all property, other than money, which has been or shall be, or which has been or shall be required to be, conveyed, transferred, assigned, delivered, or paid over to him in pursuance of the provisions of this Act, and, *in addition thereto,** acting under the supervision and direction of the President, and under such rules and regulations as the President shall prescribe, shall have power to manage such property and do any act or things in respect thereof or make any disposition thereof or of any part thereof, by sale or otherwise, and exercise any rights or powers which may be or become appurtenant thereto or to the ownership thereof in like manner as though he were the absolute owner thereof: Provided, That any property sold under this Act, except when sold to the United States, shall be sold only to American citizens, at public sale to the highest bidder, after public advertisement of time and place of sale which shall be where the property or a major portion thereof is situated, *unless the President stating the reasons therefor, in the public interest shall otherwise determine*: * * * "

Under this amendment the powers granted with respect to the disposal of enemy property are broad, indeed. It first expressly authorized "any" disposition, by sale or otherwise, as though the Custodian were the absolute owner thereof. Stoehr v. Wallace, 255 U. S. 239, 243. Whether under this broad power the Custodian, acting under the supervision and direction of the President, would have authority to destroy enemy property—for example, propaganda books and pamphlets, munitions of war unsuitable for Amer-

*All italics throughout this opinion are mine unless otherwise indicated.

ica's use, or property whose mere presence here might constitute an actual or possible menace to the public health—need not be determined for the transaction here in question was a sale. But it is clear that, save as limited by the first proviso, the powers of sale conferred by the amendment are as broad as those of an absolute owner. An absolute owner may sell his property under any terms and conditions that he, in his absolute discretion, may deem proper. He may sell it at public sale to the highest bidder, as ordinarily he would do where the only advantage to be derived by him from the sale is directly monetary. He may likewise sell it at private sale to the low bidder. Indeed, he frequently does so if, in his opinion, there will accrue to him directly, or indirectly, from such sale benefits and advantages more than sufficient to offset and overcome the direct and immediate monetary loss. The proviso, however, recognizes that with respect to some enemy property the public interest may be peculiarly interwoven. It thus recognizes that enemy property may consist of two classes—the ordinary and usual class and a special class. For the former class the proviso, itself, prescribes and rigidly fixes the conditions of sale. With respect to the special class the last clause of the proviso—"unless the President stating the reasons therefor, in the public interest shall otherwise determine"—empowers the President to nullify any or all of the statutory conditions of sale prescribed for property of the ordinary and usual class. United States v. Standard Brewery, 251 U. S. 210, 218; Levinson v. United States, 258 U. S. 198, 201. It does more. It authorizes the President to substitute other conditions in place of those nullified, for such is the meaning of "otherwise determine" when read in connection with the remainder of the amendment. But that is unimportant, for if the Presi-

dent acting under the last clause of the proviso removes the statutory conditions as to specified property, but does not prescribe other conditions of sale in place of the nullified statutory conditions, the provisions in the body of the amendment apply and the Custodian, acting under the supervision and direction of the President, may sell such property as though he were the absolute owner thereof. I see no escape from the conclusion that as to property brought within the last clause of the proviso by presidential determination in the public interest the amendment permits a freedom of action with respect to the terms and conditions of sale ample to safeguard the public interest, whatsoever be the requirements of that interest and whatever be the character of the property sold.

It is said by the plaintiff, however, that the fourth paragraph of section 12 of the act expressly makes the Custodian a common-law trustee; that, were this not true the Custodian holds the enemy property in his possession only in his official capacity; that a public office is a public trust and that as a trustee may not sell trust property for less than its fair monetary value the Custodian, a trustee, may not do so. It is true that by the act the Custodian is "vested with all of the powers of a common-law trustee in respect of all property" coming into his possession. But it is likewise true that to the Custodian, acting under the supervision and direction of the President, the statute grants *additional* powers including the express power to sell the trust property "as though he were the absolute owner thereof" if the President in the public interest removes the conditions and limitations of the proviso. The sales here in question were made not by virtue of the "common-law trustee" powers of the Custodian but in the exercise of the additional powers. Yet, it is of course true that neither the President nor

the Custodian is the owner of enemy property. "As though he were the absolute owner" was inserted in the act merely to state the extent and scope of the grant of additional power—not to confer upon the President or Custodian, personally, the beneficial interest in the property. Hence, in the sale of enemy property all officers act in an official or fiduciary capacity. But because a trustee with only the usual powers may not ordinarily sell trust property at private sale for less than its fair monetary value it by no means follows that the Custodian, acting under the supervision and direction of the President, may not do so. It will not be disputed, I take it, that the powers of a trustee over the trust property depend upon the nature of the trust and the terms of the instrument by which it is created. 26 R. C. L. 1279. Obviously the primary purpose of the Trading with the Enemy Act was the protection of the nation, not the benefit of the enemy. The trust thereby created was constituted for the benefit of the nation and the public at large. It was a public, not a private, trust. In the disposal of property under the "additional" statutory powers the statute—the instrument creating the trust—makes the President the controlling factor and the Custodian his instrumentality or agent. In all such sales the statute requires the President to consider the public interest. Public interest is not a synonym for money. It may not be defined in terms of finance. It embraces all the great public needs. It permits dealing with the conditions which exist in the nation so as to bring out of them the greatest welfare of its people. With the safety of the nation, the permanence of peace and the health of its citizens it is vitally concerned. In the category of the great pub-

lic needs these are not outranked by the nation's revenue.*

Considering the public interest in connection with the disposal of trust property requires the balancing in judgment and marshalling of the conflicting demands to which in the public interest the trust property is subject. The extent to which the trustee may act in conformity with a judgment so formed depends upon the scope of his powers. Where, as here, the powers granted with respect to the disposal of trust property are as broad as those of an absolute owner, the trustee is the judge, and, in the absence of fraud, the sole and exclusive judge, of the rank and priority to which each of the divers demands is entitled. Under such a trust there is confided to the keeping of the trustee not only the trust property but also the public interest to the extent that that interest is interwoven with the trust property or with its disposition. Under such a trust the trustee, in so far as the nature of the

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*Since the above was written what I conceive to be the same thought has been better expressed, with respect to the sale of Muscle Shoals, thus:—

"While the price is an important element, there is another consideration even more compelling. The agriculture of the Nation needs a greater supply and lower cost of fertilizer. This is now imported in large quantities. The best information I can secure indicates that present methods of power production would not be able profitably to meet the price at which these imports can be sold. To obtain a supply from this water power would require long and costly experimentation to perfect a process for cheap production. Otherwise our purpose would fail completely. It seems desirable, therefore, in order to protect and promote the public welfare, to have adequate covenants that such experimentation be made and carried on to success. The great advantage of low-priced nitrates must be secured for the direct benefit of the farmers and the indirect benefit of the public in time of peace, and of the Government in time of war. If this main object be accomplished, the amount of money received for the property is not a primary or major consideration." (President's Address to Congress, December, 1923. *Congressional Record* of December 6, 1923.)

trust property permits, may in the sale of that property promote and advance the safety of the nation, the permanence of peace, the health of its citizens, or the national finances. He may promote and advance all, or he may promote and advance either at the expense of the others. If in his judgment the widespread use of the trust property would tend to advance the safety of the nation, the health of its citizens, or the permanence of peace, the property may in its disposition be devoted to the public use even though thereby its monetary value for purposes of sale would be substantially destroyed. Such powers are, in truth, broad. But they were granted in the public interest in time of war by Congress, in the exercise of its war powers, to him who, by virtue of his office, knows "the state of the Union" and is Commander-in-Chief of its Army and Navy.

The history of the times, the condition of the country, and the uses to which enemy property in America was being put by the enemy, serve but to confirm the intent of Congress as made manifest by the plain words of the amendment. On April 6, 1917, almost three years after the outbreak of the European conflict and long after right upon right of this nation had been ignored and violated, Congress declared a state of war to exist. Six months thereafter the Trading with the Enemy Act was passed. As originally passed the fourth paragraph of section 12 authorized a "disposition" of enemy property coming into the hands of the Custodian only "if and when necessary to prevent waste and protect such property and to the end that the interests of the United States in such property and rights or of such person as may ultimately become entitled thereto, or to the proceeds thereof, may be preserved and safeguarded." It was then purely a conservation act. Property rights were made pre-eminent and guarded with the greatest solici-

tude. America, bearing no malice, no hatred, no ill-will toward any people, suspected no designs upon her sovereignty or the health of her citizens and was suspicious of no misuse of the rights and opportunities she had freely granted to the subjects and nationals of the foe. There was then little accurate or definite knowledge as to the nature or extent of the German investment in the United States. While it was known to be large it was not generally believed to be either powerful or particularly unfriendly to American interests. The Custodian became active. The reports of enemy owned property called for by section 7(a) of the act began to pour in. They came by the thousands. The extent of enemy ownership was amazing. It permeated every state of the Union and every territory and insular possession. It affected every industry. Some it monopolized. It amounted in value to hundreds of millions of dollars. (Deft.'s Ex. No. 30, Ex., pp. 2103-4; R., pp. 2511, 2523-5.) Much of this property was not innocently held or held solely for the purposes of trade and commerce. It was found that before the war a number of German owned insurance companies had insured a large number of properties here which the insurance agents periodically inspected. Another large German owned company erected and installed railways within industrial plants and mills. It had possession of their ground plans and knew the details of their construction and arrangement. All this and like information acquired by other German owned companies had been transmitted, it was found, to Berlin and there collated, indexed, arranged and made available to German competitors and to the German government. (R., p. 2754; Pltff.'s Ex. No. 16, Ex., pp. 566-8.) A German owned lumber company located on Pensacola Bay, Florida, was seized by the Custodian. It was found to own "every advantageous place on the finest harbor in the Gulf of Mexico, the

nearest harbor on American soil to the Panama Canal." Its files were filled, not with business papers but with pan-German literature. It was "a distribution center for propaganda in this country." The Custodian found other properties that were similarly used. (R., pp. 2535-6.) Let us turn to the chemical and pharmaceutical situation to which the attention of the Custodian was early attracted. As head of the Alien Property Custodian's bureau of investigation Francis P. Garvan began an investigation of this field. He was soon joined by Joseph H. Choate, Jr., who devoted himself exclusively to that task. (R., pp. 3142-3.) The inquiry was painstaking and exhaustive. Persons having knowledge of the situation were examined. Information gathered by the secret service and intelligence departments of the Government and of its allies was availed of. Reports in the archives of the Government were searched. Wireless messages passing between persons in the United States and in Germany during a period before America entered the war were inspected. Suspected persons were interrogated under oath and their books and papers examined. The salient facts thus obtained, the evils threatening the public interest and the remedy by a sale of the German chemical and allied patents to the defendant as a means for bringing about their widespread use in the United States were stated and pointed out in the report (Deft.'s Ex. No. 30) made by the Custodian to the President on February 27, 1919, and by the President transmitted to Congress on March first. This report must speak for itself. It cannot be epitomized without depriving it of strength. It must suffice to state a few facts and then let the German Consul General portray the situation. At the outbreak of the war Germany had attained in the manufacture of dyestuffs and medicinals not only the first place but to all intents and purposes a world monopoly. Prior to that

time American industry in dyestuffs and medicines consisted of little more than a series of rather small assembling plants. In medicinals very little real American manufacture existed. Scarcely any of the necessary intermediates were made here and the manufacture of dyes was confined almost entirely to working upon intermediates imported from Germany. From time to time American citizens had become interested in the development of an American industry but German bribery and dumping had prevented its success or destroyed it. The Germans applied for and were granted numerous patents. "As there was substantially no effort (with small exceptions) by any of the German concerns to manufacture in the United States, these patents were obviously obtained and held in order to prevent the formation of an American dye industry and to make impossible importation from other countries." (Ex., p. 2139.) The importation of chemicals and medicinals was cut off at the outbreak of the war. The effect upon America was duly reported to his government in Berlin, in March, 1916, by the German Consul General, Hossenfelder. He said (Deft.'s Ex. No. 72, Ex., pp. 2519-20):

"Neither through money nor the granting of credit, nor by any other means, can that critical situation be relieved which has been called forth by the removal of certain articles which are obtainable only in Germany. These articles are chiefly potash, chemicals, and dyestuffs. Potash is desired by agriculture, inclusive of the cotton-planters, all the more urgently since even last year sufficient fertilizer could not be brought to the soil. To enumerate the industries which are suffering from the scarcity of German chemicals would lead too far. *I may, however, mention that the cry for help which comes from the world of physicians is becoming louder and louder and more and more insistent.*

"*The country, however, is being hit hardest by the*

lack of dyestuffs, which makes itself felt more and more every day. * * * What the United States is able to produce in dyestuffs is neither in quality nor in shades in the remotest sufficient to meet the existing demands. It is now acknowledged here on all sides that the reports to the contrary of Mr. Norton are not only too optimistic but directly untrue. * * * In estimating the effect which will be produced by cutting off the importation of potash, chemicals, and dyestuffs it should be taken into consideration that the circle of persons affected is very extraordinarily large. Through the lack of dyestuffs alone not only is a whole list of important industries (wool, cotton, leather, paper industry, etc.), gradually made lame but for the great public living becomes more expensive both through the rise in price as well as through the small durability of all products for whose production colors are used. *We are here unquestionably face to face with conditions which are without a parallel in the past.*"

Theretofore the German Ambassador to Washington had sent to Berlin this cablegram (Deft.'s Ex. No. 62, Ex., p. 2427):

"It is reported to me by Hossenfelder * * * that the stock of dyes in this country is so small that by a German embargo about 4,000,000 American workmen might be thrown out of employment."

With respect to the withholding of medicines from us, Dr. Julius Stieglitz, professor of chemistry at the University of Chicago and who during the war was chairman of the Committee on Synthetic Drugs of the National Research Council, the scientific adviser of the Government (R., p. 3576), has since said:

"The pitiful calls of our hospitals for local anæsthetics to alleviate suffering on the operating table,

the frantic appeals for the hypnotic that soothes the epileptic and staves off his seizure, the almost furious demands for remedy after remedy, that came in the early years of the war, are still ringing in the hearts of many of us."

The President of the United States, in his message of May 20, 1919, to Congress (Deft.'s Ex. No. 164, p. 2863), said:

"The experiences of the war have made it plain that in some cases too great reliance on foreign supply is *dangerous*, and that in determining certain parts of our tariff policy domestic considerations must be borne in mind which are political as well as economic. Among the industries to which special consideration should be given is that of the manufacture of dyestuffs and related chemicals. Our complete dependence upon German supplies before the war made the interruption of trade a cause of exceptional economic disturbance. The close relation between the manufacturer of dyestuffs, on the one hand, and of explosives and poisonous gases, on the other, moreover, has given the industry an exceptional significance and value. Although the United States will gladly and unhesitatingly join in the program of international disarmament, it will, nevertheless, be a policy of obvious prudence to make certain of the successful maintenance of many strong and well-equipped chemical plants. The German chemical industry, with which we will be brought into competition, was and may well be again, a thoroughly knit monopoly capable of exercising a competition of a peculiarly insidious and dangerous kind."

By her patent monopoly, by bribery and by dumping Germany had prevented the building up of an organic chemical industry in the United States. The

relation of chemical plants operating in time of peace to the national defense in time of war was pointed out by the acting Secretary of War (Ex., pp. 2884-5) in these words: "I may state that such plants would be of unquestionable value to any government, and that their maintenance in time of peace, with the complete equipment would enable their output to be changed from dyestuffs to explosives in a week's time, [and] as claimed by Dr. Schoellkopf, would remove to a great extent the necessity for the erection and maintenance of special large plants for explosives for war purposes." The technical skill and equipment provided by an active chemical industry furnishes the means, and almost the sole means, to which the nation must look, in war and in peace, for advances in the application of chemical science to practical undertakings.

At the time of the passage of the March amendment America was, at home, truly "face to face with conditions * * * without a parallel in the past" but on the battle front she was engaged in conflict with an enemy waging a chemical warfare and passing from the use of deadly to more deadly gases. To America's credit be it said that she sought to refrain from the use of gas in warfare, forbidden by international convention. But it soon became apparent that America would be fighting on disastrously unequal terms unless she should make use of all the dread weapons being used against her by the foe. When Germany persisted in her attempts to destroy her opponents by waves and shells of poison gas in contravention of all international agreements Germany made it manifest that America's future safety lay in America's chemical independence. It was obvious that chemical independence and readiness in time of war could only follow chemical independence and development in time of peace for "the same plant that converts the benzene and the toluene, the anilin and the

toluidin of the coal tar into flaming colors or into the pain-soothing or disease curing medicinals'' are ready "to convert in war time these crude products into the all powerful T. N. T., picric acid and similar'' weapons of war. But American chemical independence could only follow an unfettered opportunity to develop that science. The amendment of March, 1918, was passed during the darkest days of the war. The Germans were striking blow after blow and making advance after advance. It was thought that Paris was about to fall and the channel ports be taken. (R., p. 2538.) It looked as if upon America was to fall the burden of carrying the war to victory. Such were the circumstances under which Congress struck out the fourth paragraph of section 12 of the Trading with the Enemy Act which authorized a disposition of enemy property only for purposes of conservation and substituted in its stead a power of disposition in the public interest as broad as that of an absolute owner. The character of the change in the statute, the circumstances under which it was made and the plain words of the amendment combine to make it clear that Congress saw that at least some enemy property was clothed with a public interest and that it was the intent of Congress to subordinate mere property rights to the welfare of the nation; they combine to make it clear that in passing the March amendment it was the intent and purpose of Congress to permit enemy property clothed, in the judgment of the President, with a public interest affecting the safety of the nation, the permanence of peace or the health of its citizens to be sold under such terms and conditions as would devote such property to the public use and thus give to the nation its greatest value and insure that not again, in peace or in war, should the health, the pain and the suffering of American citizens or the employment of American workmen or the safety of the nation itself be dependent upon

the will of another nation or its nationals. The Trading with the Enemy Act was in full force at the time the sales in suit were made. Commercial Trust Co. v. Miller, 281 Fed. 804, 806; 261 U. S. 51, 57.

The plaintiff advances many reasons, however, why the amendment should not receive this construction. Of these the most fundamental, perhaps, is that it would permit partial, and possibly total confiscation of enemy property; that confiscation of enemy property is in conflict with the law of nations and that an act of Congress should not be construed to violate the law of nations if any other construction is possible. Conceding, *arguendo,* that certain conditions of sale, though imposed in the interest of the nation, might be at least partially destructive of the monetary value of the property sold, and thus lessen the selling price, let us see if such confiscation, if confiscation it be, is in conflict with the law of nations. Inasmuch as this Government received the law of nations in its modern state of purity and refinement and for one hundred and thirty years, as plaintiff in its brief points out, has observed that law in the face of all temptation and has taken a leading part in upholding the principles of international right and the protection of private property in time of war, it is probably not necessary to go beyond the decisions of our own tribunals for guidance in ascertaining what that law is. Ware v. Hylton, 3 Dallas 199, was instituted by a subject of the King of Great Britain against citizens of the State of Virginia to recover a *debt* due at the outbreak of the Revolutionary War from the latter to the former. The defendant pleaded the confiscation of the debt by the State of Virginia. To this plea the plaintiff replied that the treaty of peace concluded between the United States and Great Britain provided "that the creditors of either side should meet with no lawful impediment to the recovery * * * of all *bona fide* debts

theretofore contracted." The defendants demurred to the replication. Judgment was had by the plaintiff, not on the ground that the plea was bad, but on the ground that the replication was good. Chase, Justice, at p. 231, said:

"From these observations, and the authority of Bynkershoek, Lee, Burlamaque and Rutherforth, I conclude, that Virginia had a right, as a sovereign and independent nation, to confiscate any British property within its territory, unless she had before delegated that power to congress, which Mr. Lewis contended she had done."

and at p. 235:

"It appears to me, that the plea, by the defendant, of the act of assembly, and the payment agreeable to its provisions, which is admitted, is a bar to the plaintiff's action, for so much of his debt as he paid into the loan-office; unless the plea is avoided or destroyed, by the plaintiff's replication of the fourth article of the definitive treaty of peace between Great Britain and the United States, on the 3d of September, 1783."

The view of Mr. Justice Patterson was expressed at p. 254 thus:

"It has been made a question, whether the confiscation of debts, which were contracted by individuals of different nations, in time of peace, and remain due to individuals of the enemy, in time of war, is authorised by the law of nations among civilized states? I shall not, however, controvert the position, that by the rigor of the law of nations, debts of the description just mentioned may be confiscated."

Mr. Justice Iredell, who sat in the court below and who, though not voting, read the reasons given by him

in support of the judgment of the Circuit Court, observed, p. 268:

"If the state, *de jure*, according to the law of nations (which I strongly incline to think), had a right wholly to confiscate this debt, they had undoubtedly a right to proceed a partial way towards it, by receiving the money, and discharging the debtor, substituting itself in his place."

At page 270:

"For these reasons, I am clearly of opinion, that under the acts of sequestration, and the payment and discharge, the discharge will be a complete bar in the present case, unless there be something in the treaty of peace to revive the right of the creditor against the defendant, so as to disable the latter from availing himself of the payment into the treasury, in bar to the present action."

Wilson, Justice, p. 281, states:

"When the United States declared their independence, they were bound to receive the law of nations, in its modern state of purity and refinement. By every nation, whatever is its form of government, the confiscation of *debts* has long been considered disreputable: and we know, that not a single confiscation of that kind stained the code of any of the European powers, who were engaged in the war which our revolution produced."

But he immediately adds:

"Nor did any authority for the confiscation of debts proceed from congress (that body, which clearly possessed the right of confiscation, as an incident of the powers of war and peace), and therefore, in no instance can the act of confiscation be considered as an act of the nation."

In Brown v. United States, 8 Cranch 110, a case arising out of the War of 1812, Chief Justice Marshall, as to the right of confiscation, at pp. 122-3, said:

"Respecting the power of government, no doubt is entertained. That war gives to the sovereign full right to take the persons and confiscate the property of the enemy wherever found, is conceded. The mitigations of this rigid rule, which the humane and wise policy of modern times has introduced into practice, will more or less affect the exercise of this right, but cannot impair the right itself. That remains undiminished, and when the sovereign authority shall choose to bring it into operation, the judicial department must give effect to its will. But until that will shall be expressed, no power of condemnation can exist in the court."

and at pp. 128-9:

"When war breaks out, the question, what shall be done with enemy property, in our country, is a question rather of policy than of law. The rule which we apply to the property of our enemy, will be applied by him to the property of our citizens. Like all other *questions of policy*, it is proper for the consideration of a department which can modify it at will; not for the consideration of a department which can pursue only the law as it is written. It is proper for the consideration of the legislature, not of the executive or judiciary."

In that case Mr. Justice Story who held the view, contrary to that of a majority of the Court, that the declaration of war in and of itself authorizes confiscation, said, p. 143:

"On a review of authorities, I am entirely satisfied, that, by the rigor of the law of nations and of the common law, the sovereign of a nation may lawfully

confiscate the debts of his enemy, during war, or by way of reprisal: and I will add, that I think this opinion fully confirmed by the judgment of the supreme court in *Ware v. Hylton,* 3 Dall. 199, where the doctrine was explicitly asserted by some of the judges, reluctantly admitted by others, and denied by none.

"In respect to the goods of an enemy, found within the dominions of a belligerent power, the right of confiscation is most amply admitted by Grotius, and Puffendorf, and Bynkershoek, and Burlamaqui, and Rutherforth and Vattel. See Grotius, and Puffendorf, and Bynkershoek, *ubi supra*; and Bynk. Qu. Pub. Jur. c. 4, and 6; 2 Burlam. p. 209, § 12, p. 219, § 2, p. 221, § 11; Ruth. lib. 2, c. 9, pp. 558-73. Such also is the rule of the common law. Hale, in Harg. Law Tracts, p. 245, c. 18."

On August 6, 1861, and July 17, 1862, the Congress passed statutes, commonly termed the confiscation acts, providing for the seizure and sale of enemy property. Wherever brought in question these acts have been uniformly upheld as a legitimate exercise of the war power of the nation. In Miller v. United States, 11 Wallace 268, it was urged that these acts were unconstitutional. The court in overruling this contention said at pp. 305-6:

"The question, therefore, is, whether the action of Congress was a legitimate exercise of the war power. The Constitution confers upon Congress expressly power to declare war, grant letters of marque and reprisal, and make rules respecting captures on land and water. Upon the exercise of these powers no restrictions are imposed. Of course the power to declare war involves the power to prosecute it by all means and in any manner in which war may be legitimately prosecuted. It therefore includes the right to seize and confiscate all property of an enemy and to dispose of it

at the will of the captor. This is and always has been an undoubted belligerent right. If there were any uncertainty respecting the existence of such a right it would be set at rest by the express grant of power to make rules respecting captures on land and water. It is argued that though there are no express constitutional restrictions upon the power of Congress to declare and prosecute war, or to make rules respecting captures on land and water, there are restrictions implied in the nature of the powers themselves. Hence it is said the power to prosecute war is only a power to prosecute it according to the law of nations, and a power to make rules respecting captures is a power to make such rules only as are within the laws of nations. Whether this is so or not we do not care to inquire, for it is not necessary to the present case. It is sufficient that the right to confiscate the property of all public enemies is a conceded right. Now, what is that right, and why is it allowed? It may be remarked that it has no reference whatever to the personal guilt of the owner of confiscated property, and the act of confiscation is not a proceeding against him. The confiscation is not because of crime, but because of the relation of the property to the opposing belligerent, a relation in which it has been brought in consequence of its ownership. It is immaterial to it whether the owner be an alien or a friend, or even a citizen or subject of the power that attempts to appropriate the property. In either case the property may be liable to confiscation under the rules of war. It is certainly enough to warrant the exercise of this belligerent right that the owner be a resident of the enemy's country, no matter what his nationality. The whole doctrine of confiscation is built upon the foundation that it is an instrument of coercion, which, by depriving an enemy of property within reach of his power, whether within his territory or without it, impairs his ability to resist the confiscating government, while at the same

time it furnishes to that government means for carrying on the war. Hence any property which the enemy can use, either by actual appropriation or by the exercise of control over its owner, or which the adherents of the enemy have the power of devoting to the enemy's use, is a proper subject of confiscation."

The Spanish-American war was followed by Juragua Iron Co. v. United States, 212 U. S. 297, and Herrera v. United States, 222 U. S. 558. In the former the court, at p. 306, quotes with approval the language of Miller v. United States that "It is sufficient that the right to confiscate the property of all public enemies is a conceded right." In the Herrera case the court, pp. 571-2, referring to The Grapeshot, 9 Wall. 129, observed:

"But it was not intended to express a limitation upon the undoubted belligerent right to use and confiscate all property of an enemy and to dispose of it at will."

That there are no restrictions upon the war power of Congress to confiscate enemy-owned property is, as I venture to think, no longer debatable. Yet, while the right of the nation to confiscate enemy property is absolute, the extent to which that right shall be exercised during any particular war is a matter of policy to be determined solely by Congress in the passage of its war measures. Courts may inquire whether an act passed by Congress is within the scope of its constitutional *power*. Beyond this they may not go. The scope of judicial inquiry does not extend to a review of legislative *policy*. Whether a legislative act is wise or unwise, whether it is based on sound theory or principle, are matters solely for the judgment of Congress. Such matters are not within the range of judicial cognizance. Chicago B. & Quincy R. Co. v. McGuire, 219

U. S. 549, 569; German Alliance Ins. Co. v. Kansas, 233 U. S. 389, 414; Hamilton v. Kentucky Distilleries Co., 251 U. S. 146, 161. If it be supposed, as sometimes it is supposed, that there resides in the court a power to fashion and mould a statute according to its own notions of justice, of wisdom, or of policy, I know of no such power. The judicial function is to give voice and effect to the law as it is—not to make the law. Moreover, the tendency of modern enlightened nations to exempt, as a general rule enemy property from confiscation arose with respect to debts and property acquired in the usual course of trade. Magna Charta Sec. 41; Lawrence's Wheaton on International Law, pp. 526, 536. "It is not an immutable rule of law, but depends on political considerations which may continually vary." Chief Justice Marshall in Brown v. United States, 8 Cranch 110, 128. Consequently, it is not surprising that no authority has been cited and none has been found showing that the modern usage has ever been extended to property whose return to the enemy might jeopardize the interest, the welfare, the safety or the independence of the capturing nation. On the contrary it affirmatively appears that it has been recognized, only recently, that certain property does not fall within the modern liberal rule. Interpreting the Act of Congress of August 6, 1861, the Supreme Court in Kirk v. Lynd, 106 U. S. 315, 316, 317, after quoting Miller v. United States, *supra*, that the statute "was aimed exclusively at the seizure and *confiscation* of property used to aid, abet, or promote the rebellion, then a war, or to maintain the war against the government," said:

"In war the capture of property in the hands of the enemy, used, or intended to be used, for hostile purposes, is allowed by all civilized nations, and this whether the ownership be public or private."

The principle of that case would seem to extend to all enemy property affecting the public interest of the nation. Moreover it is readily seen that political considerations and a due regard for the public interest would leave the capturing nation without choice in the matter of the retention or return of certain enemy property, for instance, property whose return would leave the capturing nation without modern weapons of war, or opportunity to produce them, and, so, defenseless. Construed according to its plain language and without resort to extrinsic facts I think the amendment is not in conflict with the rules of international law with respect to the confiscation of enemy property but in consonance, rather, with the most modern practice of the most enlightened nations relating thereto. Construed in the light of the history of the times, the condition of the country and the uses being made of enemy property in America the result is the same.

The examination of plaintiff's contention with respect to confiscation should not be concluded, however, without an investigation and appreciation of its full significance.

It is not denied, in fact it is one of the premises upon which plaintiff plants its case that, speaking abstractly, it is possible to impose conditions of sale that will destroy in whole or in part the value of the property sold. This is equally true whether the sale be public or private. If it is confiscation to impose at a private sale conditions that will prevent the proceeds of sale of enemy property from being equal in value to the property of which the enemy owner is deprived it is, of course, confiscation if the same conditions, or other conditions having the like effect, are imposed at a public sale. But if international law or the enlightened practice thereunder forbids the former, the latter is likewise forbidden. Consequently, if the statute itself directly and expressly imposes

conditions of sale under which the proceeds of sale would inevitably be less than the value of the property to its enemy owner such statutory conditions of sale would be confiscatory and fall under the ban of plaintiff's contention in the same manner as the conditions imposed with respect to the sale of the property in suit. Yet it cannot be denied that the statute authorizes a sale of any enemy property coming into the possession of the Custodian; that the amendment of November, 1918, expressly authorizes the seizure and disposal of enemy owned patents; and that the March amendment requires, in the absence of presidential action, "that any property sold under this Act, * * *, shall be sold only to American citizens." Dr. Holderman testified that the Haber process patents were worth millions of dollars to their original German owners. (R., p. 2381.) Yet the evidence is overwhelming that the Haber process patents were and are without substantial affirmative value to American citizens. (R., pp. 3820-22, 3971-3, 4013-15.) Had those patents been sold to American citizens at public sale instead of at private sale and only the net proceeds of such sale paid to their former enemy owners those owners would have suffered an almost total loss in the value of their property. If that is not confiscation a similar result produced by conditions imposed at a private sale is not confiscation and plaintiff's contention with respect to confiscation is without merit. If it is confiscation it follows that the plaintiff's contention is of a character to prevent or nullify that which the statute, section 7 (c) and section 12 as amended, expressly authorizes, namely, the sale of enemy owned patents to American citizens only. It would prevent or nullify the sale, either public or private, of every enemy owned patent having any real value to its original enemy owner. This is true for that which has been said with respect to the Haber patents ap-

plies in greater, lesser or like degree to practically all enemy patents. American citizens, or for that matter allies and neutrals, could pay for enemy patents, without regard to whether the sale is public or private, not more than a fractional part of the value such patents would have to the former enemy owner. The title to the patents was uncertain. They might have been assigned or licenses on nominal terms might have been granted to neutrals by the enemy owners prior to sale and these facts have been unknown to American citizens. Yet when sold under the Trading with the Enemy Act they are accompanied by no warranty of title. The patents might be perfectly valid and so known to be by their German owners. Yet they were unadjudicated and an American citizen by reason of the war would be unable to satisfy himself upon this point. For the most part the German patents had not been used in the United States. An American citizen purchasing the patents under the statute would not be able to obtain from the inventor or the German owner the benefit of the inventor's practical experience in arriving at the invention or the German owner's practical experience in operating thereunder. "From the nature of the property the real value of patents can only be determined after the invention is introduced and in use." Insurance Press v. Montauk Wire Co., 103 N. Y. App. Div. 472, 475. "The value of a patent is in its nature speculative." Alpha Portland Cement Co. v. Schratweiser, (C. C. A. 2) 221 Fed. 258, 259. German patents had a bad reputation. In a book published in 1917—Seward's Science and the Nation, Defendant's Ex. 50, p. 18—Sir William Pope was quoted as saying:

"In fact, some German patents are drawn up for the purpose of discouraging investigation by more practical methods; thus, any one who attempted to repeat the method for manufacturing a dye-stuff pro-

tected by Salzmann & Krueger in the German Patent No. 12,096, would be pretty certain to kill himself during the operation."

In the official report of the Department of Commerce 1915, Special Agent Series No. 96 (Deft.'s Ex. No. 51, p. 48) it was said: "It is claimed with authority that not over one per cent. of the German patents in this industry [dyestuffs] have ever proved remunerative." Dr. George W. McCoy, Director of the laboratory of the United States Public Health Service, and a witness for the plaintiff in this case, testifying before the Committee on Interstate and Foreign Commerce of the House of Representatives with respect to the salvarsan patents, (R., pp. 4454-5) said:

"Doctor McCoy. The processes, as described by the patents, I am told—now, this is hearsay—are the very minimum required to secure the patent, and in no way adequate to enable even a competent chemist to reproduce the material.

"Mr. Huddleston. So that the parties who are now producing a satisfactory quality of this product are not proceeding by the formula as filed in the Patent Office, but are proceeding as their experience has taught them, having figured out in some way how to produce this substance?

"Doctor McCoy. Yes, that is a fair statement . . .

"Doctor McCoy. I have talked that matter with some of the most able chemists in the United States and they all say that the description in the patent is so sketchy and there is so much necessary that is omitted that a well-qualified chemist cannot proceed and produce the material. He has to do a great deal of experimenting. I know one large, well-equipped manufacturing house commanding the best

chemical talent money can secure, that spent about eighteen months before they turned out the first commercial batch of salvarsan."

That which was testified to by Dr. McCoy before the Congressional Committee is established by the evidence in this case with respect to the chemical and pharmaceutical patents generally. These and other obvious risks and hazards incident to the purchase of enemy patents make it clear that from a business point of view they constituted an investment of a most highly speculative character. Their certain affirmative value was too slight and problematical to warrant the payment by American citizens of a sum even remotely approximating what they may have been worth to the German owners for monopolistic or other purposes. Any ability to practice the process of the patents or to make the products thereof that might become apparent after sale as a result of long periods of costly experiments, or otherwise, is without practical evidential value in determining what an American citizen would have been justified in paying for the patents or would pay for them before such ability became apparent. Nor could any knowledge howsoever acquired by an American citizen prior to sale of how to use an enemy patent be properly considered in estimating the value to an American citizen of the naked patent unless that information was disclosed by the patent itself, or was known to the man skilled in the art of the patent. As a sale of the naked enemy patents under the express conditions of sale laid down in the Trading with the Enemy Act could produce only a fractional part of the value of such property to the original enemy owner it is manifest that the upholding of plaintiff's contention with respect to confiscation would be destructive in a large measure of the express provisions of the Act. But, in any event,

neither the power to seize the property in suit nor the lawfulness of that seizure is denied. (R., p. 2767.) The price at which property so seized is sold is not decisive of the amount of indemnity, if any, that will be paid to the original enemy owner for such seizure and sale. In the matter of indemnity the courts are without jurisdiction. That is a matter for other departments of the government. It was said in Young v. United States, 97 U. S. 39, 60, "* * * an aggrieved enemy must look alone for his indemnity to the terms upon which he agrees to close the conflict." By the Treaty of Berlin, Germany gave to the United States and the United States accepted the benefits of the Treaty of Versailles. By the latter Treaty it was provided that as between the Allies and Associated Powers or their nationals on the one hand and Germany or her nationals on the other hand, all the exceptional war measures, or measures of transfer, or acts done or to be done in execution of such measures, in paragraphs 1 and 3 of the Annex should, with certain reservations not here pertinent, be considered as final and binding upon all persons. (Treaty of Versailles, Part X, Art. 297 [d].) By paragraph 1 of the Annex to that article of the Treaty the validity of all orders, directions, decisions or instructions made or given or purporting to be made or given with regard to enemy property, rights and interests was confirmed and it was there provided that no question should be raised as to the regularity of a transfer of any property, rights or interests dealt with in pursuance of any such order, direction, decision or instruction. Furthermore by paragraph (i) of the same article of the Treaty Germany undertook to compensate her nationals in respect of the sale or retention of their property, rights or interests in Allied or Associated States. Manifestly all claims of Germany and Germany's nationals to the property in suit are barred. Herrera v. United

States, 222 U. S. 558, 574. If Germany or Germany's nationals are incidentally suffering from the exercise by the United States of its constitutional powers and its confirmed acts it is for Congress, not for the Executive or for the Courts, in a suit prosecuted by the Attorney General or otherwise, to determine whether under the circumstances of the particular case justice requires that compensation or additional compensation be made. Union Bridge Co. v. U. S., 204 U. S. 364, 403.

I think the construction hereinbefore placed upon the Trading with the Enemy Act is neither forbidden nor made doubtful by any law or practice of nations with respect to enemy property.

Turning from questions of international law the plaintiff urges that the construction hereinbefore placed upon the Trading with the Enemy Act brings it in conflict with the Constitution of the United States in that the power to confiscate enemy property is a legislative power and cannot be delegated either to the Custodian acting under the supervision and direction of the President, or to the President. That Congress cannot delegate its legislative power is, of course, not questioned. But in the Trading with the Enemy Act there is no delegation of legislative power. The statute is, in practical effect, in the alternative. It contemplates the existence of two classes of enemy property—the ordinary and usual class and a special class distinguished from the former by its relation to the public interest. The statute places upon the President the duty of dividing the enemy property into those classes by placing upon him the duty of designating the property of the latter class. With respect to each of these classes the powers of the executive officers are fixed by the statute. For the sale of property of the usual class the conditions of sale are expressly fixed by the statute. In the disposition of

property of the special class—with which the public interest is interwoven—the powers of sale are as broad as those of an absolute owner. Neither in the determination of the fact that certain enemy property is linked with the public interest nor in the exercise of the discretion with respect to the terms and conditions of its sale—matters within the discretion of an absolute owner—is there to be found the exercise of a legislative power. The leading case upon this question is Field v. Clark, 143 U. S. 649. The court, pp. 693-4, said:

"'The true distinction,' as Judge Ranney speaking for the Supreme Court of Ohio has well said, 'is between the delegation of power to make the law, which necessarily involves a discretion as to what it shall be, and conferring authority or discretion as to its execution, to be exercised under and in pursuance of the law. The first cannot be done; to the latter no valid objection can be made.' Cincinnati, Wilmington &c. Railroad v. Commissioners, 1 Ohio St. 88. In Moers v. City of Reading, 21 Penn. St. 188, 202, the language of the court was: 'Half the statutes on our books are in the alternative, depending on the discretion of some person or persons to whom is confided the duty of determining whether the proper occasion exists for executing them. But it cannot be said that the exercise of such discretion is the making of the law.' So, in Locke's Appeal, 72 Penn. St. 491, 498: 'To assert that a law is less than a law, because it is made to depend on a future event or act, is to rob the legislature of the power to act wisely for the public welfare whenever a law is passed relating to a state of affairs not yet developed, or to things future and impossible to fully know.' The proper distinction, the court said, was this: 'The legislature cannot delegate its power to make a law; but it can make a law to delegate a power to determine some fact or state of things upon

which the law makes, or intends to make, its own action depend. To deny this would be to stop the wheels of government. There are many things upon which wise and useful legislation must depend which cannot be known to the law-making power, and, must, therefore, be a subject of inquiry and determination outside of the halls of legislation.' "

The objection now urged to the validity of the March amendment if given the meaning hereinbefore attributed to it has frequently been urged with respect to the validity of section 18 of the River and Harbor Act of March 3, 1899, 30 Stat. 1153, Sec. 9970, Comp. Stat. 1916. That statute authorizes the Secretary of War (1) to determine that a bridge constructed over a navigable waterway is an unreasonable obstruction to the free navigation of such waters and (2) to specify the changes required to be made. In Union Bridge Co. v. United States, 204 U. S. 364, arising under that statute, Field v. Clark and many other cases are reviewed. In Monongahela Bridge v. United States, 216 U. S. 177, 192, the court summarized its prior decisions thus:

"That §18 of the River and Harbor Act of March 3, 1899, 30 Stat. 1151, could not reasonably be taken as a delegation of legislative and judicial power to an Executive Department of the Government; that the statute did not in any real, constitutional sense delegate to the Secretary of War any power that must, under our system of government, be exclusively exercised either by the legislative or judicial branch of the Government; that under its paramount power to regulate commerce on and over the navigable waters of the United States Congress could require that such waters be freed from unreasonable obstructions to navigation; that the statute in effect prescribed the general rule, applicable to all navigable waters, that free

navigation should not be hampered by unreasonable obstructions arising from bridges of insufficient height, width of span or other defects; that instead of exerting its power by direct legislation in each case of a bridge alleged to constitute an unreasonable obstruction to navigation, Congress charged the Secretary of War with the duty of ascertaining, in each case, upon notice to the parties concerned, whether the particular bridge came within the general rule prescribed; that any other method was impracticable in view of the vast and varied interests of the Nation requiring legislation from time to time; that the Secretary of War, proceeding under the act of 1899, could not be said to exercise strictly legislative or judicial power any more than when, upon investigation the Head of a Department ascertains, under the direction of Congress, whether a particular applicant for a pension belonged to a class of persons who, under a general rule prescribed by Congress, were entitled to pensions; and that a denial to Congress of authority, under the Constitution, to delegate to an Executive Department or officer the power to determine some fact or some state of things upon which the enforcement of its enactment may depend, would often render it impossible or impracticable to conduct the public business, and to successfully carry on the operations of the Government."

In my opinion the position of plaintiff is not well taken.

The plaintiff further urges that the construction hereinbefore placed upon the amendment to section 12 of the Trading with the Enemy Act would bring it in conflict with the fifth amendment to the Constitution in that it would permit the confiscation of property of American citizens "resident within the territory • • • of any nation with which the United States is at war,"

"enemies" by virtue of Section 2 of the act. The same objection was raised in Miller v. United States, 11 Wall. 268, 304, with respect to the Civil War confiscation acts. The court said:

"• • • if the statutes were not enacted under the municipal power of Congress to legislate for the punishment of crimes against the sovereignty of the United States, if, on the contrary, they are an exercise of the war powers of the government, it is clear they are not affected by the restrictions imposed by the fifth and sixth amendments. • • • The confiscation is not because of crime, but because of the relation of the property to the opposing belligerent, a relation in which it has been brought in consequence of its ownership. It is immaterial to it whether the owner be an alien or a friend, or even a citizen or subject of the power that attempts to appropriate the property. In either case the property may be liable to confiscation under the rules of war. It is certainly enough to warrant the exercise of this belligerent right that the owner be a resident of the enemy's country, no matter what his nationality."

In Juragua Iron Co. v. United States, 212 U. S. 297, 308, the Court quoted with approval from Whiting's "War Powers Under the Constitution" as follows:

"A neutral, or a citizen of the United States, domiciled in the enemy's country, not only in respect to his property, but also as to his capacity to sue, is deemed as much an alien enemy as a person actually born under the allegiance and residing within the dominions of the hostile nation." The point having been expressly decided by the Supreme Court there is here neither occasion nor room for its discussion.

Plaintiff's next contention is not that the construction placed upon the amendment of March, 1918, would render *that* amendment unconstitutional but that it would bring into conflict with the fifth amendment to the Constitution that portion of the amendment of November, 1918, to section 7 (c) of the act which provides:

"The sole relief and remedy of any person having any claim to any money or other property heretofore or hereafter conveyed, transferred, assigned, delivered, or paid over to the Alien Property Custodian, or required so to be, or seized by him shall be that provided by the terms of this Act, and in the event of sale or other disposition of such property by the Alien Property Custodian, shall be limited to and enforced against the net proceeds received therefrom and held by the Alien Property Custodian or by the Treasurer of the United States."

That provision applies only to citizens, allies and neutrals whose property has been mistakenly seized or seized and sold. It does not apply to "enemies or allies of enemies." Sigg-Fehr v. White, 285 Fed. 949, 952. Section 7 (c) is not directly involved in this suit. Plaintiff's theory with respect to the last clause of that section, as I understand its theory, is that persons not enemies or allies of enemies under the act are entitled, by virtue of the fifth amendment of the Constitution, to just compensation for any property of theirs that may be seized and sold under the belief that it is enemy property; that any property sold under the March amendment may mistakenly include property belonging to persons not enemies or allies of enemies; that if such property may be sold for less than just compensation it would render unconstitutional the provision limiting the relief of allies, neutrals and resident citizens to the net proceeds received

for their property and that a statute should be construed as a whole, so as, if possible, to bring no part into conflict with a constitutional provision. But if it be clear that the validity of sales made under the express statutory conditions of the March amendment is not dependent upon whether or not the proceeds of sale amount to just compensation it may not be presumed that there is any implied requirement that the proceeds of a sale made otherwise than under the statutory conditions must amount to just compensation. It cannot be denied that property actually enemy owned was the dominant theme of the March amendment—the only property within its direct aim. With respect to such property the fifth amendment, as we have just seen in Miller v. United States and in Juragua Iron Co. v. United States, is without application. The statutory conditions are "that any property sold under this Act, * * * , shall be sold only to American citizens, at public sale to the highest bidder, after public advertisement of time and place of sale which shall be where the property or a major portion thereof is situated, * * *." That is all. There is no express requirement that at such a sale the proceeds must equal just compensation. Were there such a requirement, when and by whom would it be determined whether the proceeds of sale are equivalent to just compensation? Not by the officers making the sale, for the determination of what constitutes just compensation is a judicial, not an executive or a congressional, function. United States v. New River Collieries, 262 U. S. 341; Monongahela Navigation Co. v. United States, 148 U. S. 312, 327. But there is no statutory provision for judicial confirmation of the sale. Does the question remain open and the validity of the sale hang in the balance until determined in a suit instituted against the purchaser by the United States urged to diligence by no statute of limitation? Such a possi-

bility would make every purchase a speculation, a purchase price equivalent to just compensation a remote contingency and the statute self-destructive. Nor are the bare statutory conditions laid down in the proviso of the March amendment adequate to make certain that the purchase price will in fact invariably amount to just compensation. The advertisements though made in strict conformity with the statute and in the utmost good faith may not be seen by any persons particularly interested in the property to be sold. Storms may prevent the attendance of many bidders. The bidders in attendance may not know how to use the property offered for sale or be appreciative of its true value. A judicial determination that the price received for property sold under the bare statutory conditions amounts as a matter of law in all cases and under all circumstances to just compensation for the property sold would be a judicial stultification. It would devitalize the fifth amendment. The field of operation of the last clause of the November amendment is narrow. It is not of the gist of the statute. It is but an incidental provision. It does not even provide the sole or main relief for persons whose property has been mistakenly seized, the primary relief being that prescribed by section 9. Ahrenfeldt v. Miller, 282 Fed. 944 (C. C. A. 3); Kahn v. Garvan, 263 Fed. 909, 916. Its constitutionality is not raised by the facts of this case and is not decided. I think it sufficient to say that, whether it is valid as to property of American citizens not enemies under the act, allies and neutrals, or any of them (see New York Central R. R. Co. v. Winfield, 244 U. S. 147), it casts no doubt upon the compelling clearness of purpose evident in the language of the amendment of March, 1918, with respect to property actually enemy owned.

Passing from objections based upon the Constitution to one founded solely upon the statute itself the

plaintiff urges that the construction heretofore placed upon the Trading with the Enemy Act as amended is inconsistent with the sixth paragraph of section 12 of that act which provides:

"After the end of the war any claim of any enemy or of an ally of enemy to any money or other property received and held by the alien property custodian or deposited in the United States Treasury, shall be settled as Congress shall direct." The amount of enemy property and money subject to congressional action after the war was necessarily dependent upon the extent, the terms and the conditions of the disposition thereof by Congress during the war—not contrariwise. Acts of executive officers done during the war in the exercise of the powers of disposal conferred upon them by Congress have the same force and effect "that would have been accorded to direct action" by Congress. See Monongahela Bridge v. United States, 216 U. S. 177, 195. The sixth paragraph of section 12 of the act did not purport to control or prescribe the powers of disposition of enemy property during the war or the terms and conditions of such disposal. Those matters were expressly dealt with by other provisions of the act and particularly by the amendment of March, 1918. In the construction of that amendment I think the sixth paragraph of section 12 of the act affords no material guidance. The construction hereinbefore placed upon the Trading with the Enemy Act must stand.

That the power conferred by the statute was not validly exercised is a further contention of the plaintiff. It takes the position that the power conferred upon the President by the March amendment could be exercised only by the President in person. With certain exceptions not here pertinent the President by an order of December 3, 1918 vested in Frank L. Polk all power and authority conferred upon the President by

the provisions of section 12 of the act as amended. Mr. Polk was the Solicitor of the Department of State and as such an officer of the United States. The orders with respect to the property in suit were made by Mr. Polk on February 26 and April 5, 1919. In the view of the plaintiff these orders are a nullity. A similar objection was made in Stoehr v. Wallace, 255 U. S. 239, which arose under that portion of section 7 (c) of the act as amended dealing with property of persons "who shall have been determined by the President, after investigation, to be an enemy or ally of enemy." The President directed that that power be exercised by the Custodian. It was contended that the act of the Custodian determining after investigation the enemy ownership of the property in suit was void. The court, pp. 244-245, said:

"Whether the objection would be good if it turned entirely on the words of §7c, on which the plaintiff relies, we need not consider; for they obviously are qualified and explained by §5, which very plainly enables the President to exercise his power under §7c 'through such officer or officers as he shall direct.' By the orders already noticed the President directed that this power be exercised through the Alien Property Custodian. It therefore is as if the words relied on had been 'which the President, acting through the Alien Property Custodian, shall determine after investigation' is enemy-owned, etc. In short, a personal determination by the President is not required; he may act through the Custodian, and a determination by the latter is in effect the act of the President. Central Union Trust Co. v. Garvan, 254 U. S. 554; The Confiscation Cases, 20 Wall. 92, 109."

The words of section 5 are, in my opinion, as applicable to the amendment to section 12 as to the amendment to section 7(c).

The validity of the order of the President of December 3, 1918, is further challenged because as plaintiff interprets the order the power therein conferred upon Mr. Polk was to be exercised by him in his personal capacity and not as an officer of the United States. It is true that the words "as Solicitor of the Department of State" do not follow the name of Mr. Polk or appear elsewhere in the order. But it is likewise true that Mr. Polk was Solicitor of the Department of State and as such an officer of the United States. He was not lacking in capacity to exercise the powers granted. The mere addition or omission of the official designation after the name of a person is not conclusive upon the question of the capacity in which he acts. 6 R. C. L. 877; 22 R. C. L. 476. A striking illustration of this principle is found in Exhibit M to the bill of complaint. That document, signed by our late lamented President, though clearly an official act, in terms nowhere alludes to the office of President. It cannot be presumed that in making the order of December 3, 1918, the President was doing a vain thing. On the contrary there is a presumption of law that every public officer acts rightly. The maxim is *omnia præsumuntur rite esse acta.* That construction which sustains and vitalizes an instrument should be preferred to that which strikes down and paralyzes it. United States Fidelity & G. Co. v. Board of Com'rs, 145 Fed. 144, 149 (C. C. A. 8). There are in the order no affirmative words showing unmistakably that the grant of power was made to Mr. Polk in his personal capacity. The objection stands wholly upon the failure to insert in the order after Mr. Polk's name the words "Solicitor of the Department of State." This fact is not sufficient, I think, to invalidate the order. Moreover, the sales to the defendant authorized and directed by Mr. Polk were ratified by the President himself by order of February 13, 1920.

It is asserted that the purpose of sale was not to secure a fair value for the property, but to promote the interest of the dye and chemical industries and that the transaction was in legal effect the granting of a subsidy to private industry. This challenge of the motives of the officers making the sale is supported, I think, neither by the facts nor by the law. Property becomes "clothed with a public interest when used in a manner to make it of public consequence, and affect the community at large." Munn v. Illinois, 94 U. S. 113, 126. In Clark v. Nash, 198 U. S. 361, a use of property was declared to be public which, independent of the conditions existing in the State, might otherwise have been considered as private. This was reaffirmed in Bacon v. Walker, 204 U. S. 311, 315. See also Block v. Hirsh, 256 U. S. 135, 155; Noble State Bank v. Haskell, 219 U. S. 104, 110, 580. The extent to which the property in suit is of public consequence and how greatly its use affects the community at large has already been pointed out as has also the fact that the greatest value of the property to the nation lay in its use, not in its monetary worth. Mr. Polk, in whom resided the power to decide the matter, determined that "the public interest will be best served by a wide use of the inventions covered by said letters patent and similar rights." (Order of Feb. 26, 1919, R., Vol. I, p. 551.) To serve that interest and to obtain for the nation the greatest benefit it was essential that the property should be devoted to the public use. If the property was sold under such terms and conditions as to assure its being devoted to the public use it matters not what benefits or detriments may have flowed as incidents therefrom. It, therefore, becomes pertinent to inquire whether the terms and conditions under which the property was sold were such as to afford assurances that it would be and remain devoted to the public use. The defendant was chartered under the laws of the

state of Delaware February 19, 1919, with the special object and purpose of acquiring from the Alien Property Custodian "patents, and applications therefor, trademarks, choses in action, and rights and claims of every character and description, owing or belonging to or held for, by, on account of, or on behalf of, or for the benefit of, an enemy or ally of enemy, as defined by said act, [The Trading with the Enemy Act] which the Alien Property Custodian is authorized by said act, and amendments thereto, to require and seize, and to sell and convey, * * * and to hold any such property and rights so acquired in a fiduciary capacity for the Americanization of such industries as may be affected thereby, for the exclusion or elimination of alien interests hostile or detrimental to the said industries, and for the advancement of chemical and allied science and industry in the United States." (R., pp. 90, 91.) In furtherance of those objects and purposes the charter provides that "the corporation may grant non-exclusive licenses only, to make, use, and sell the inventions covered by any patents owned or controlled by it to the United States of America, upon such terms as the board of directors may determine, and also upon reasonable and equal terms and without advantage, as between licensees, to the following: (1) Natural persons, citizens of the United States; (2) Copartnerships, all the members of which are citizens of the United States; and (3) corporations organized under the laws of the United States or of any State, Territory, or dependency of the United States, of which not less than three-fourths of the capital stock and the beneficial interest therein is owned by stockholders who are citizens of the United States and who were not, prior to the 'end of the war', as used in the 'Trading with the Enemy Act', enemies or allies of enemies, as defined by said act, and the amendments thereto.

The board of directors may refuse to issue any license or may revoke any license granted by the corporation and may prescribe the terms and conditions of said licenses." (R., p. 91.) The general powers are limited to those having "connection" with the special object of the corporation. The authorized capital stock is $500,000, divided into 4,000 shares of preferred stock, non-voting save upon proposed amendments to the charter, and 1,000 shares of common stock. The preferred stock is entitled to cumulative dividends at the rate of 6% per annum and is subject to redemption at par and accumulated dividends. Dividends upon the common stock are non-cumulative and are limited to 6% per annum. After the redemption of the preferred stock the net earnings of the corporation in excess of the amount necessary for working capital "shall be used and devoted to the development and advancement of chemistry and allied sciences, in the useful arts and manufactures in the United States, in such manner as the board of directors may determine." (R., p. 94.) As some citizens, either naturalized or native born, might if granted a license use that license not "for the advancement of chemical and allied science and industry in the United States" but to its detriment, it was obviously necessary to leave the power to refuse or revoke a license to the board of directors. It was equally important that that discretionary power, with which the board of directors was necessarily vested in order to prevent the subversion of the dominant purpose of the transfer of the property to the defendant, should not be exercised to restrict the use of that property to any less than the whole number of Americans who should desire in good faith to use that property for the advancement of science and industry in America. To this end and to prevent the possibility that self interest might obscure

the broad public interest intended to be served the persons then engaged in the chemical industry in America, who purchased the capital stock of the defendant, were permitted neither to act as directors nor to name the directors of the defendant. It was made a condition of the sale that the original directors and officers "should be of those who had been particularly and intimately associated with the work of investigating the German hold upon the chemical industry in America." (R., p. 2631.) The directors elected in accordance with this plan were Francis P. Garvan, Douglas I. McKay and George J. Corbett none of whom were financially interested in the chemical industry. But the term of office of an officer or director of the defendant—a Delaware corporation—is short. It was necessary to look beyond that term and provide for the safeguarding of the public interest throughout the life of the longest patent. Hence, the stockholders of the defendant were required to transfer and deliver their shares of stock to trustees to be held by them until January 1, 1936. The trustees selected were likewise persons who had no private or selfish interest to serve and whose patriotism and loyal devotion to the public interest had also been tried under the stress and strain of the war. The persons designated as the trustees were Otto T. Bannard, George L. Ingraham, Cleveland H. Dodge, Benjamin H. Griswold, Jr., and Ralph Stone who constitued by appointment of the President the Advisory Sales Committee of the Alien Property Custodian. The trustees were made self perpetuating. The result was characterized by the President as a "wonderful accomplishment." (Deft.'s Ex., No. 150, R., p. 3238; Ex., p. 2843.) The devotion of the property to the public use stands not upon written documents alone. It has a deeper foundation—the property is in the keeping of men who

have in its management no selfish interest to serve and whose devotion to the public interest has been established. No better plan for devoting the property to the public use has been suggested. The plan has stood the most severe of all tests—actual trial. The defendant has kept the faith. This it has done not only by granting licenses in furtherance of the purpose for which defendant was chartered but also at its great expense by the distribution of books and pamphlets showing the national necessity for the practical development of chemical science in America. If, perchance, those heretofore engaged in the chemical and allied industries have derived an incidental advantage from the plan that incidental result cannot invalidate a transaction lawfully consummated in the public interest. The same charge would lie against the validity of every tariff act. Incidental results flowing from the accomplishment of his main purpose have been used, but ineffectively, to nullify the acts of the Secretary of War under the statute of March 3, 1899. Scranton v. Wheeler, 179 U. S. 141; Union Bridge Co. v. United States, 204 U. S. 364. The transaction in suit was not one granting a subsidy to a private industry. It was a devotion in the public interest of the property to a public use. The property is available for any American citizen, copartnership or corporation that desires to use it for the advancement in the United States of the only science or industry to which, by reason of its nature, that property is applicable. The sale was in effect a sale to America and its citizens, not to persons then engaged in chemical and allied industries. But there is a further reason that prevents the upholding of this and other contentions of the plaintiff with respect to the terms and conditions of the sale.

If the executive officers upon whom Congress con-

ferred the power of disposal of enemy property acted within the scope of their powers their acts are not subject to judicial nullification or review. Acts done within the field of power marked out by Congress are controlled only by the judgment and discretion of those to whom the power has been granted. The boundaries of that field are barriers for the officers and the courts alike. Beyond those boundaries the officers may not pass, within them the courts may not go. The invasion of that field by the courts to determine whether the public interest required that the property in suit should be sold otherwise than under the statutory conditions of sale prescribed for property of the ordinary and usual class and to set aside the sale should the judgment of the courts be different from that of the President would be a judicial nullification not only of the act of the President, but, also, of the act of Congress conferring upon the President the power to determine what the public interest required. The power to dispose of the property in suit as though he were the absolute owner thereof having been granted to the Custodian, acting under the supervision and direction of the President, the courts may not nullify the sale because the terms and conditions thereof were otherwise than in the judgment of the court they should have been. Moreover, what the public interest requires depends upon the conditions existing in the nation. Courts do not know the "state of the Union" and, as I apprehend, are not equipped to ascertain it. Those to whose keeping the public interest, so far as it is intermixed with enemy property, has been confided by Congress must be the sole judges of what the public interest requires. In Dakota Cent. Tel. Co. v. South Dakota, 250 U. S. 163, the right of the President to take over and control intrastate telephone lines in the exercise of his power under the joint resolution of Congress of July 16, 1918, was chal-

lenged. The court held, as stated in the syllabus that "whether the exercise of the power so conferred was justified by the conditions at the time, or was actuated by proper motives, are questions of executive discretion not within the cognizance of the judiciary, under the Constitution." That "the judicial may not invade the legislative or executive departments so as to correct alleged mistakes or wrongs arising from asserted abuse of discretion" was reaffirmed. (Page 184.) In Martin v. Mott, 12 Wheat. 19, 30, the Supreme Court was asked to review the decision of the President, made under the Constitution and an act of Congress, that the situation in one of the states was such as to make it necessary to call out the militia. Mr. Justice Story, speaking for the court, said:

"• • • We are all of opinion, that the authority to decide whether the exigency has arisen, belongs exclusively to the President, and that his decision is conclusive upon all other persons. We think that this construction necessarily results from the nature of the power itself, and from the manifest object contemplated by the act of Congress. • • • Besides, in many instances, the evidence upon which the President might decide that there is imminent danger of invasion, might be of a nature not constituting strict technical proof, or the disclosure of the evidence might reveal important secrets of state, which the public interest, and even safety, might imperiously demand to be kept in concealment. • • •

"The law does not provide for any appeal from the judgment of the President, or for any right in subordinate officers to review his decision, and in effect defeat it. Whenever a statute gives a discretionary power to any person, to be exercised by him, upon his own opinion of certain facts, it is a sound rule of construction, that the statute constitutes him the sole and exclusive judge of the existence of those facts. And in

the present case, we are all of opinion, that such is the true construction of the act of 1795. It is no answer, that such a power may be abused, for there is no power which is not susceptible of abuse. The remedy for this, as well as for all other official misconduct, if it should occur, is to be found in the Constitution itself. In a free government, the danger must be remote, since, in addition to the high qualities which the Executive must be presumed to possess, of public virtue, and honest devotion to the public interests, the frequency of elections, and the watchfulness of the representatives of the nation, carry with them all the checks which can be useful to guard against usurpation or wanton tyranny."

That the same principles apply to an officer, other than the President, acting only under an act of Congress is likewise settled. In Monongahela Bridge v. United States, 216 U. S. 177, the defendant, in a suit instituted by the United States to compel the making of alterations in a bridge determined by the Secretary of War to be an unreasonable obstruction to navigation, offered to prove that the bridge was not an unreasonable obstruction to navigation and that the changes in the bridge ordered by the Secretary of War were not necessary. The court, page 195, said:

"It was not for the jury to weigh the evidence and determine, according to *their** judgment, as to what the necessities of navigation required, or whether the bridge was an unreasonable obstruction. The jury might have differed from the Secretary. That was immaterial; for Congress intended by its legislation to give the same force and effect to the decision of the Secretary of War that would have been accorded to direct action by it on the subject. It is for Congress,

*Italics in text.

under the Constitution, to regulate the right of navigation by all appropriate means, to declare what is necessary to be done in order to free navigation from obstruction, and to prescribe the way in which the question of obstruction shall be determined. Its action in the premises cannot be revised or ignored by the courts or by juries, except that when it provides for an investigation of the facts, upon notice and after hearing, before final action is taken, the courts can see to it that Executive officers conform their action to the mode prescribed by Congress. Learned counsel for the defendant suggests some extreme cases, showing how reckless and arbitrary might be the action of Executive officers proceeding under an act of Congress, the enforcement of which affects the enjoyment or value of private property. It will be time enough to deal with such cases as and when they arise."

The requirement of the amendment of March, 1918, that the reasons in the public interest for the President's determination be stated does not, in my opinion, affect the pertinency of the principles of the cases cited to the case at bar. The statement of the reasons actuating the President does not make his act any the less an act of discretion. Moreover, the judicial power to determine whether the reasons assigned are supported by the facts extends to any and all reasons or to none. It is conceded that the President may not be brought into court to substantiate his reasons. The statute does not require him to disclose to the purchaser the evidence upon which his reasons were based. The statute does not limit the Executive in the assignment of reasons to such as may be supported by legal evidence or by facts available to the public. Obviously, if the validity of a sale of enemy property to a purchaser may be challenged at any time by the United States on the ground that the reasons assigned

by the President in the public interest were not supported by the facts and the sale be set aside unless the purchaser succeeds in establishing by legal proof in a court of law that the President's reasons were supported by facts few, if any, purchasers could meet the burden. They would be wholly at the mercy of the seller, the United States. A sale of that character would be nothing more than a game of chance in which the result—the stability or validity of the sale—would always be within the control of the seller. A sales statute exposing such a solecism would be not only useless, it would be paradoxical.

The bill of complaint charges that the seizure and sales of the property in suit were induced, brought about and accomplished by and through a combination, scheme and conspiracy of certain representatives of the chemical and dye industries. The charge is found in paragraph 22 of the bill. It is:

"That with the object and purpose of securing such control of said enemy-owned patents, copyrights, trade-marks, labels, and other similar rights and applications therefor, and for the purposes hereinbefore stated, said persons, firms, corporations, and trade associations and others associated with them in said industry and in the control and monopoly thereof conceived and entered into a scheme, combination, and conspiracy prior to or about November, 1918, to induce and procure the seizure of said enemy-owned patents, copyrights, trade-marks, labels, and other similar rights and applications therefor by the Alien Property Custodian, and the sale, transfer, and assignment thereof by said Alien Property Custodian to themselves or to some corporation, agency, or institution controlled by them."

At the opening of the trial the court announced that each party to the suit would be permited, with-

out regard to the usual rules of evidence, to take and put of record all evidence that, in the opinion of its counsel, would in any manner tend to prove or disprove any issue of the case. (R., pp. 869-871, 2589.) Notwithstanding the generality of the allegations and the unlimited opportunity afforded the plaintiff to support them by evidence the charges of deception and conspiracy have failed utterly. The contrast between the allegations and the proof may be illustrated by that which was alleged concerning the two assignments made by the present Custodian and his testimony pertaining thereto. The bill of complaint, which was verified by the present Custodian, states (R., p. 54): "Complainant is informed, believes, and therefore avers that said instruments of alleged sale, assignment, and transfer were prepared by or at the instance and procurement of said defendant, * * *." His testimony was (R., pp. 2197-8). "XQ. 414. Now, Colonel, I want to take up with you the two assignments to the Chemical Foundation that you signed. Those were drawn in your office, were they not? A. Why certainly; any order that I sign is drawn in my office. XQ. 415. Well, those were drawn in your office, were they not? A. Yes, sir. XQ. 416. And they were drawn by your employees? A. Yes, sir." Immediately following the above quoted allegation the bill of complaint states (R., p. 54) that the Alien Property Custodian "executed said instruments without knowledge of the facts herein set forth and other necessary and essential facts in relation to the alleged sale, assignment, and transfer of said patents and other rights; that said facts were withheld from him with intent and purpose to secure the execution by him of the instruments aforesaid, which he would not have executed had the true facts been known to him; * * *." The testimony of the Custodian was (R., p. 2200): "XQ. 434. What facts are there that you know now or when you signed

the bill of complaint that you did not know when you signed the assignment? Now, have I made it plain? A. As your question, Mr. Kresel, concerns two different questions [assignments] by me, I must discuss in my answer the two assignments separately. XQ. 435. I wish you would. A. I would not have signed the second assignment of November 1 [5], 1921, had I known all of the information brought to me by my counsel, by the Department of Justice, at the time the Chemical Foundation suit came up. I would sign the first transaction of April 27, 1921, over again and I have got no apologies for it and I criticize no one for bringing it to me. * * * XQ. 451. What were the facts which came to your knowledge before you verified the bill of complaint herein which, if you had known in November, 1921, you would not have signed this assignment of November, 1921? Do you understand my question? A. Yes, sir. Why, the bringing of this suit, which was brought at the direction of the President, upset what we might term the friendly relations existing between my office and the Chemical Foundation. And I certainly would not have executed the November 5, 1921, assignment had I known that the Chemical Foundation sale was going—XQ. 452. The Chemical Foundation what? A. (Continuing.) That the Chemical Foundation sale was going to be questioned by the Department of Justice. * * * XQ. 455. You say in this paragraph that I have read to you that facts were withheld from you with intent and purpose to secure the execution by you of the aforesaid instrument. What facts were withheld and suppressed from you? A. I cannot enumerate any facts at this time, Mr. Kresel. * * * XQ. 457. * * * You say in your bill that facts were withheld and suppressed from you. Can you not state what facts were withheld or suppressed from you? A. I can not state any more facts in answer to

your questions than I already have." In view of this testimony and the obvious fact that the power to charge persons with fraud and conspiracy is a weapon with which serious irremediable injury may be done to innocent persons if such charges are lightly made it is difficult to understand why the specific charges to which the foregoing testimony relates were made. Yet the remaining like charges were equally lacking in evidential support. In fact, at the argument the plaintiff seemed no longer to press those charges against the persons alleged to be the conspirators, but it sought to have the charges sustained as against the officers of the government who formulated and carried out in the public interest the plan of sale of the property in suit. No authority is necessary to show that this may not be done. But if that were legally permissible it would not avail the plaintiff for such charges, too, would be without evidential support. While I know of no case where by implication of law the duty of clearing itself from imputed fraud rests upon the defendant, yet the defendant has met even this burden. The testimony of Mr. Palmer, who was neither cross-examined nor contradicted, discloses the circumstances which gave rise to the plan and that it was at his request that representatives of the industry to which the patents in suit appertain gave their aid and financial assistance in carrying it into execution. (R., pp. 2598-2606.) Mr. Garvan's testimony is to the same effect. (R., pp. 2790-2791.) But the establishment of this fact is not left to depend upon memory. It is corroborated, if not independently established, by the documentary evidence of the plaintiff. (Pltff.'s Ex. No. 27, dated January 25, 1919, Ex., p. 84.) Its allegations and evidence with respect to conspir[illegible] and deception do not advance the plaintiff towards the goal for which it strives.

The plaintiff contends that the assignments made by Mr. Garvan as Alien Property Custodian to the defendant are invalid for the further reason that at the time of making the assignments Mr. Garvan was its president. Prior to Mr. Palmer's resignation as Alien Property Custodian he caused the organization of the defendant "for the purpose of diverting these German Chemical Patents into general public use for the benefit of this country." The terms and conditions of sale had been agreed upon. To make certain that all the purposes for the consummation of which the defendant was organized would be carried out not only in the letter but in the spirit in which they were conceived Mr. Palmer made it a condition that the officers of the defendant should be persons named by him. Mr. Garvan, who had been particularly and intimately associated with the work of investigating the German hold upon the chemical industry in America and in evolving the plan to be carried out through the instrumentality of the defendant and who "was more familiar with this situation than anybody in the country" was selected by Mr. Palmer to be the president of the defendant. Mr. Garvan agreed to accept. Mr. Palmer was then appointed Attorney General of the United States. Late in the afternoon of March 3, 1919, he called upon the President of the United States to present his resignation as Alien Property Custodian and to urge the immediate appointment of his successor. The sale of the property to the defendant was discussed. The President was told the facts above narrated (R., pp. 2625-2636). Mr. Palmer stated to the President that he considered the actual consummation of the Americanization of the German chemical patents was the most important constructive work that "we had on hand." Mr. Palmer urged Mr. Garvan's appointment as Custodian and said "* * * that my purpose in urging Mr. Garvan's appointment as Alien

Property Custodian was quite largely in view of the fact that he had undertaken to be the president of this corporation and I knew he could be absolutely trusted to carry out its plans and purposes to the letter and in their full spirit. I would not have felt so safe in putting this plan over if I had not been able to pick out from my organization men of that kind who could and would operate it not only as we wanted it to be run but with a patriotic desire to serve their country." (R., p. 2632.) Mr. Palmer had with him the commission in blank as Alien Property Custodian and after Mr. Palmer's statement the President took the commission and wrote in the name of Francis P. Garvan. Mr. Palmer delivered it to Mr. Garvan that evening. Mr. Garvan took the oath of office the next day. He became president of the defendant on March 8th. With the exception of the two assignments executed by the present Custodian all the assignments to the defendant were executed by Mr. Garvan as Custodian. Plaintiff's present contention rests upon section 41 of the Criminal Code of the United States which provides: "No officer or agent of any corporation, joint stock company, or association, and no member or agent of any firm, or person directly or indirectly interested in the pecuniary profits or contracts of such corporation, joint stock company, association, or firm, shall be employed or shall act as an officer or agent of the United States for the transaction of business with such corporation, joint stock company, association, or firm. Whoever shall violate the provision of this section shall be fined not more than two thousand dollars and imprisoned not more than two years." (35 Stat. 1097.) The first paragraph of section 7 (e) of the Trading with the Enemy Act provides, however, that "No person shall be held liable in any court for or in respect to anything done or omitted in pursuance of any order, rule or regulation made by the President under

the authority of this Act." If, as was held in Miller v. United States, 11 Wall. 268, statutes with respect to enemy property are "not enacted under the municipal power of Congress to legislate for the punishment of crimes against the sovereignty of the United States" but, on the contrary, "are an exercise of the war powers of the government" and "are not affected by the restrictions imposed by the fifth and sixth amendments" to the Constitution it is equally clear that with respect to enemy property Congress may, if it chooses, free the President and those "acting under his supervision and direction" from the restraint of statutes passed when only the normal affairs of the nation are in contemplation. That Congress did elect so to do with respect to enemy property in America during the late war is, I think, placed beyond controversy by the clear, broad and general language of section 7 (e) of the Trading with the Enemy Act. As said by the German Consul General America was "unquestionably face to face with conditions * * * without a parallel in the past." Congress met those conditions, in part, by the passage of the Trading with the Enemy Act. Thereby almost unlimited power with respect to enemy property was conferred upon the President. None of that property could be disposed of save under his supervision and direction. In the public interest he could make such disposition thereof as he deemed proper and the nature of the property permitted. By the Trading with the Enemy Act Congress made him commander in chief of the civil officers having to do with enemy property almost if not quite as completely and effectively as the Constitution made him commander in chief of the army and navy. It did more. It made the Trading with the Enemy Act and the orders of the President thereunder the supreme law with respect to enemy property. It validated every act done by a subordinate officer in obedience to such orders of the Pres-

ident. See Martin v. Mott, 12 Wheat. 19, 29-32. The Custodian, who was not barred by section 41 of the Criminal Code or otherwise from being also an officer of the defendant, was subject to the order and direction of the President. All acts done by the Custodian touching the property in suit were done "under the supervision and direction of the President." By reason of section 7 (e) of the Trading with the Enemy Act, section 41 of the Criminal Code is without relevancy to acts so done, and, hence, without relevancy to the issues of this suit.

During the trial of thirty-three days, in the closing argument, consuming five full days and in the briefs containing approximately two thousand pages, some other questions with respect to the validity of the sale were raised, but none, I think, after examining them, that call for further consideration or make it necessary to extend an opinion whose present length is justified only by the great mass of testimony and exhibits and the earnestness and thoroughness with which the many questions presented were debated by the counsel for the respective parties.

In view of the conclusions hereinbefore arrived at the incidental motions of the parties become moot and are denied.

Finding no ground upon which the sale of enemy property to the defendant may be set aside the bill of complaint must be dismissed.

(Sgd.) HUGH M. MORRIS,
J.

January 3, 1924.

FINAL DECREE.

(Filed February 18, 1924).

AND NOW, to wit, this eighteenth day of February, A. D. 1924, this cause having been brought to final hearing, and having been argued by counsel for the respective parties, thereupon, upon consideration thereof, it is

ORDERED, ADJUDGED and DECREED by the Court as follows:

1. That the bill of complaint filed by the United States of America in the above-entitled cause, be and hereby is dismissed.

2. That the Chemical Foundation, Incorporated, defendant, do recover from the United States of America, plaintiff, the moneys advanced by the defendant under the orders of the Court herein entered May 7, A. D. 1923, and July 23, A. D. 1923, for fees in taking testimony and expenses in printing the record, in pursuance of said orders, the amounts thereof to be taxed by the clerk as costs in this cause.

(Sgd.) HUGH M. MORRIS,
J.

PETITION FOR APPEAL.

(Filed January 26, 1924.)

The above-named complainant conceives itself aggrieved by the decree made and entered herein on the eighteenth day of February, 1924, in the above-entitled cause, does hereby appeal from said order and decree to the United States Circuit Court of Appeals for the Third Circuit for the reasons specified in the assignment of errors which is filed herewith and it prays that this appeal may be allowed and that a transcript of the record, proceedings and papers upon which said order was made, duly authenticated, may be sent to the United States Circuit Court of Appeals for the Third Circuit. Said complainant further prays the court that since the entire evidence in this cause taken has been by order of this court printed at a great expense and sufficient copies thereof are now available for the purpose of this appeal, that the parties hereto be relieved of the requirement of reducing the evidence herein to a narrative form and that this court enter an order requiring the entire evidence, so printed as aforesaid, to be inserted and included in the transcript of the record to be forwarded to said United States Circuit Court of Appeals for the Third Circuit.

UNITED STATES OF AMERICA,
By (Sgd.) H. M. DAUGHERTY,
Attorney General of the United States.
(Sgd.) JAMES M. BECK,
Solicitor General of the United States.
(Sgd.) JAMES H. HUGHES, JR.,
United States District Attorney for the District of Delaware.
(Sgd.) HENRY W. ANDERSON,
Special Assistant to the Attorney General.
(Sgd.) HERMAN J. GALLOWAY,
Special Assistant to the Attorney General.
Its Solicitors of Record.

4969

ASSIGNMENTS OF ERROR.

(Filed February 26, 1924.)

Now comes complainant, the UNITED STATES OF AMERICA, by its solicitors of record, and says that in the proceedings in the said District Court of the United States for the District of Delaware, in the above entitled cause, and in the final decree made and entered therein on the eighteenth day of February, 1924, the said court committed manifest errors against the just rights of the complainant herein, and assigns the following errors among others:

I. The Court erred in holding that the alleged sales and assignments made by Francis P. Garvan to the defendant, The Chemical Foundation, Incorporated, were not in violation of the statutes and laws of the United States, and especially of Section 41 of the Criminal Code of the United States and in holding that Section 7, Clause (e) of the "Trading With the Enemy Act," as amended, made said statutes and laws including Section 41 of said Criminal Code inapplicable to this case; and in not holding that said alleged sales and assignments by said Francis P. Garvan to said defendant were in violation of said statutes and laws of the United States, and especially in violation of said Section 41 of said Criminal Code, and were null, void and of no effect, and that complainant was entitled to the relief prayed in the bill.

II. The Court erred in its construction of the Act of Congress approved October 6, 1917, known as the "Trading With the Enemy Act," and the amendments thereto, mentioned and described in the record in this cause, and in the opinion of the Court herein, among other things in holding that said act and amendments

thereto constituted a valid delegation of legislative power by Congress; that said act and amendments thereto authorized the confiscation in whole or in part of the property mentioned and described in the record in this cause; that said act and amendments thereto authorized the sale or disposition of said property for less than its fair value; and authorized the Alien Property Custodian or other officers of the United States to regard the public interest or benefit as consideration in whole or in part for the sale or disposition of said property; that said act and amendments thereto conferred upon the Alien Property Custodian the powers of an absolute owner in and with respect to said property and the sale and disposition thereof; and that said act and amendments thereto authorized the sale and assignments of the properties mentioned and described in the record in this cause as, in the manner and for the consideration therein set forth; and in not holding that said act and amendments thereto required the Alien Property Custodian as a trustee or fiduciary having control of said properties in making sale thereof to make a fair sale for an adequate and proper consideration, with only the rights and powers and subject to the duties of a trustee with respect thereto; and that said alleged sales and assignments as shown in the record, were unauthorized by said act and amendments thereto, were in violation thereof, and were illegal, null and void and conferred no rights upon the defendant.

III. The Court erred in holding that said "Trading With the Enemy Act" and amendments thereto, as construed and interpreted by the Court, were valid and constitutional, and in not holding that said act and amendments thereto as so construed were in violation of the Constitution of the United States and amendments thereto, and were therefore unconstitutional,

null and void, in that, among other things, as so construed they constituted an invalid effort to delegate the legislative functions and powers of Congress; undertook to confer upon executive officers the power to confiscate property; undertook to authorize the confiscation of private property of American citizens, neutrals and other persons not enemies or allies of enemies within the meaning of said act; undertook to authorize executive officers of the Government to grant bounties to private industry; and were as so construed otherwise in violation of the Constitution of the United States and amendments thereto.

IV. The Court erred in holding that the acts of the Alien Property Custodian and other officers and agents of the United States, as set forth in the record in this cause, and in the opinion of the Court herein, were not justiciable or subject to judicial review; and in not holding that it was the function and duty of the court to review and determine the power of said officers, and the legality of any and all of their said acts, and to consider and adjudicate any and all questions raised by and in the record in this cause as to or affecting the legality, validity and effect of said acts or any of them on any ground whatever; and in not holding that the acts of said Alien Property Custodian in making said alleged sales and assignments as disclosed by the record, were illegal, null, void and of no effect.

V. The Court erred in holding that private sales and assignments of the properties mentioned and described in the record in this cause were lawfully authorized, and among other things in holding that the power to determine upon a private sale of alien property vested in the President by Section 12 of said "Trading With the Enemy Act," as amended, could

be delegated to, vested in, or exercised by any other officer or person; that Frank L. Polk was lawfully authorized to exercise said powers; that the orders of said Frank L. Polk in this regard were legal or valid, or conferred any power to make private sales of said properties; or that the same were ever ratified by the President; and in not holding that the powers vested in the President by said Section 12 of said act, as amended, could only be exercised by him personally; that the authority alleged to have been vested in Frank L. Polk by the order of December 3, 1918, was sought to have been conferred upon him personally and not as an officer of the United States, and that said alleged authority was for these and other reasons invalid; that said Frank L. Polk was without lawful authority to determine upon or authorize private sales of said properties; that the orders of said Frank L. Polk of February 26, 1919, and April 5, 1919, were unlawful, null and void; that the same were never ratified by the President; that there was no valid or lawful authority to make private sales and assignments of said properties, and that the pretended sales and assignments of said properties as set forth in the record were unauthorized, illegal, null and void.

VI. The Court erred in holding that the President stating his reasons therefor lawfully authorized the Alien Property Custodian to sell at private sale to the defendant the properties involved in this suit upon such terms and conditions as the said Alien Property Custodian might see fit; and in holding that any lawful authority was given or had for said alleged sales or assignments; and holding that the alleged authority to make said alleged private sales, or said alleged sales or assignments or any of them, were ever ratified by the President.

VII. The Court erred in holding that said alleged sales and assignments to defendant were lawful and valid; and in not holding that the same were unlawful, null and void, for the reasons among others that the same were not lawfully authorized; that they were not made in accordance with the alleged orders of Frank L. Polk; that no effort was made to ascertain or to obtain the fair value of said properties; that many separate properties held in separate trusts were attempted to be sold in bulk and without any apportionment of the purchase price, and under such conditions as made any equitable apportionment thereof impossible; that there was a combination of all prospective bidders therefor and prospective purchasers thereof; that said properties were attempted to be sold in a manner and under such conditions as destroyed or impaired the value thereof; that the relations of the parties attempting to sell and purchase said properties to each other and to the subject matter were such as to make said alleged sales illegal; that the price was arbitrarily arrived at, and was grossly inadequate; that said alleged sales were not fair sales of said property for a just and adequate consideration, and for other reasons apparent upon the face of the record in this cause.

VIII. The Court erred in holding that the properties sought to be sold or assigned to defendant as set forth in the record were without substantial value, and that the same were sold for a valid and adequate consideration; and in not holding that the said properties were of large value individually and in the aggregate, and that the alleged sales and assignments thereof were for invalid and inadequate considerations and were illegal, null and void.

IX. The Court erred in holding that the alleged sales and assignments of properties to defendant as

set forth in said record, did not constitute an unlawful confiscation of property and the unlawful granting of bounties to private industry; and in not holding that the same did constitute an unlawful confiscation of property and the unlawful granting of bounties to private industry, and were therefore illegal, null and void.

X. The Court erred in holding that the alleged sales and assignments set forth in the record were not induced by and made in pursuance and as a part of an unlawful combination, scheme or conspiracy to do or cause to be done a lawful act in an unlawful manner and for an unlawful purpose, and to unlawfully restrain or monopoize the foreign and interstate commerce of the United States, in violation of the statutes and laws of the United States; and in not holding that said alleged sales and assignments were induced by and made in pursuance and as a part of such unlawful combination, scheme and conspiracy, and were illegal, null and void as against the United States.

XI. The Court erred in holding that the various properties sought to have been sold and assigned by the Alien Property Custodian to defendant as shown by the record were at the beginning of the war, or at the time of the seizure thereof, all owned by subjects of Germany.

XII. The Court erred in holding that the properties mentioned and described in the record or any of them were sold and assigned to the defendant to be held by it for the public benefit, or to be held upon the terms and conditions set forth in the charter of the defendant; and in not holding that the same were undertaken and intended to be sold and assigned to

defendant without any reservation or limitation whatsoever, and that such alleged sales and assignments were illegal, null and void.

XIII. The Court erred in holding that the evidence was overwhelming that the Haber Process patents were and are without substantial affirmative value to American citizens; and in each and every of its rulings upon the evidence as to said Haber Process patents adverse to complainant as shown upon the record in this cause; and in overruling the motion of complainant for subpœna *duces tecum* to be directed to the officers of the Atmospheric Nitrogen Corporation requiring them to produce their records and to appear and give evidence as to the use of said Haber Process patents by said corporation and the value thereof, reference being hereby made to the record in this cause for the terms of said motion and the ruling of the Court thereon.

XIV. The Court erred in sustaining the objections of defendants to questions propounded to witnesses Volwiler and Bolton as to processes used by the Abbott Laboratories and the E. I. du Pont de Nemours Company in the production of certain manufactured products produced and sold under licenses issued under certain patents involved in this suit described in said questions and evidence, and in refusing to permit complainant to inquire into said processes and the use thereof, upon the ground that it would require the disclosure of trade secrets, and in thus denying to complainant the right to prove the use of said patents and processes and the value thereof.

XV. The Court erred in overruling the motion of the complainant to require the production of the books

and records of the E. I. du Pont de Nemours Company, showing the products manufactured and sold under patents involved in this suit, and the profits derived therefrom as showing the value of said patents and processes.

XVI. The Court erred in each and every of its rulings adverse to the complainant, upon the admission and exclusion of evidence, and on motions for the production of books, records and testimony during the trial of the cause, which said motions, questions and rulings are fully set out in the record in this cause, and are hereby referred to as if herein copied at length.

XVII. The Court erred in each and every of its conclusions of law as set out in its decisions and rulings adverse to complainant during the trial of this cause appearing at length upon the record; and in each and every of its conclusions of law contained in its opinion in this cause made a part of the record herein.

XVIII. The Court erred in ordering the taxation of the costs of the cause against the United States of America.

XIX. The Court erred in dismissing the bill of complaint herein and in denying to complainant the relief prayed for in each and all of the prayers of said bill.

WHEREFORE, complainant prays that the final decree in this cause may be reversed, and that complainant may be granted appropriate relief in the premises,

in accordance with the prayers of the bill of complaint herein.

THE UNITED STATES OF AMERICA,

By (Sgd.) H. M. DAUGHERTY,
Attorney General of the United States.

(Sgd.) JAMES M. BECK,
Solicitor General of the United States.

(Sgd.) JAMES H. HUGHES, JR.,
United States District Attorney for the District of Delaware.

(Sgd.) HENRY W. ANDERSON,
Special Assistant to the Attorney General.

(Sgd.) HERMAN J. GALLOWAY,
Special Assistant to the Attorney General.
Its Solicitors of Record.

ORDER ALLOWING APPEAL.

(Filed February 26, 1924.)

The complainant herein having this day filed in open court its petition for appeal to the United States Circuit Court of Appeals for the Third Circuit, and its assignment of errors and further praying that the entire evidence in this cause, which has heretofore been printed in accordance with an order of this Court, be included and inserted in the transcript of record to be forwarded to the United States Circuit Court of Appeals for the Third Circuit, and that said complainant be relieved of the requirement of reducing the evi-

dence herein to a narrative form, and the Court having considerd the same and having heard counsel thereon, it is this twenty-sixth day of February, 1924,

ADJUDGED, ORDERED AND DECREED, that complainant's claim of appeal be and the same is hereby allowed and that complainant herein be relieved of the requirement of reducing the evidence herein to a narrative form and that the entire evidence in this cause which has heretofore been printed in accordance with an order enterd by this Court be included and inserted in the transcript of the record to be forwarded to the said United States Circuit Court of Appeals for the Third Circuit.

(Sgd.) HUGH M. MORRIS,
Judge of the United States District Court for the District of Delawre.

CITATION.

(Filed February 26, 1924.)

UNITED STATES OF AMERICA, *ss.:*

THE PRESIDENT OF THE UNITED STATES,

To The Chemical Foundation, Incorporated, a Corporation Organized and Existing Under the Laws of the State of Delaware:

You are hereby cited and admonished to be and appear in the United States Circuit Court of Appeals for the Third Circuit in the city of Philadelphia, State of Pennsylvania, on the twenty-seventh day of March, A. D. 1924, pursuant to an appeal duly obtained from a decree of the District Court of the United States for the District of Delaware, wherein United States of

America is appellant and you are appellee, and show cause, if any there be, why said decree against the appellant should not be corrected and why speedy justice should not be done to the parties in that behalf.

WITNESS the Honorable HUGH M. MORRIS, Judge of the District Court of the United States for the District of Delaware, at
(Seal) Wilmington, in said District, this twenty-sixth day of February, A. D. 1924, and the independence of the United States of America the one hundred and forty-eighth.

(Sgd.) HUGH M. MORRIS,
United States District Judge,
District of Delaware.

February 26, 1924.

Service accepted for The Chemical Foundation, Incorporated, appellee.

(Sgd.) GUTHRIE, JEROME, RAND & KRESEL.
(Sgd.) WM. G. MAHAFFY,
Solicitors for Defendant-Appellee.

PRÆCIPE FOR TRANSCRIPT OF RECORD.

(Filed February 26, 1924.)

Please prepare and certify transcript of record in the above-entitled cause for filing in the United States Circuit Court of Appeals for the Third Circuit, including therein the following, *viz.:*

1. Docket entries.

2. Bill of complaint with exhibits, motion to amend bill and amendments to bill; Answer and motion to strike out portion thereof; Record of proceedings at trial as printed for use of District Court, (Volumes 1

to 12, inclusive), and evidence taken in camera and sealed.

3. Exhibits of defendant not included in the printed record to be used as physical exhibits.

4. Exhibits of plaintiff not included in the printed record to be used as physical exhibits.

5. Volume thirteen of the record of the District Court in the cause, said volume containing copies of the patents involved in the cause, to be used as a physical exhibit.

6. Order of Court dated May 7, 1923, appointing William F. Smart, official stenographer to take the testimony in the cause; order of Court dated July 23, 1923, directing the preparation and printing of the record of proceedings in the cause and providing for expenses of said printing.

7. Opinion of the District Court.

8. Decree entered by the District Court.

9. Petition for Appeal, Order allowing appeal and Assignments of error.

10. Citation.

11. Præcipe for transcript of record.

12. Clerk's certificate.

(Sgd.) HERMAN J. GALLOWAY,
(Sgd.) JAMES H. HUGHES, Jr.,
Solicitors for Complainant-Appellant.

To H. C. Mahaffy, Esq.,
Clerk, U. S. District Court:

Service of a copy of the foregoing præcipe accepted this twenty-sixth day of February, A. D. 1924.

(Sgd.) Guthrie, Jerome, Rand & Kresel.
(Sgd.) Wm. G. Mahaffy,
Solicitors for Respondent-Appellee.

CLERK'S CERTIFICATE.

UNITED STATES OF AMERICA,
DISTRICT OF DELAWARE, } *ss.:*

I, HENRY C. MAHAFFY, JR., Clerk of the District Court of the United States for the District of Delaware, do hereby certify that I have carefully compared the writings annexed to and accompanying this certificate, in twelve volumes:

Volume I, pleadings, pages 1 to 590, inclusive.
Volume II, testimony, pages 591 to 1360, inclusive,
Volume III, testimony, pages 1361 to 2110, inclusive,
Volume IV, testimony, pages 2111 to 2866, inclusive,
Volume V, testimony, pages 2867 to 3618, inclusive,
Volume VI, testimony, pages 3619 to 4390, inclusive,
Volume VII, testimony, opinion and appeal papers, pages 4391 to 4983, inclusive,
Volume VIII, Exhibits, Volume I, pages 1 to 740, inclusive,
Volume IX, Exhibits, Volume II, pages 741 to 1448, inclusive,
Volume X, Exhibits, Volume III, pages 1449 to 2028, inclusive,
Volume XI, Exhibits, Volume IV, pages 2029 to 2700, inclusive,
Volume XII, Exhibits, Volume V, pages 2701 to 3491, inclusive,

and find the same to be true and correct copies of their respective originals, so full and complete as the same

now remain on file and of record in my office, being a complete exemplification of the record and proceedings in the case of United States of America v. The Chemical Foundation, Incorporated, No. 502 in equity, pending in said court, made up in accordance with the præcipe of counsel for the complainant-appellant filed in said cause.

IN WITNESS WHEREOF I have hereunto set my hand and affixed the seal of said court, at Wilmington, in said district, this seventeenth day of March, A. D. 1924, (Seal) and the independence of the United States of America the one hundred and forty-eighth.

(Sgd.) H. C. MAHAFFY, JR.,
Clerk U. S. District Court,
District of Delawre.

IN THE UNITED STATES CIRCUIT COURT OF APPEALS, FOR THE THIRD CIRCUIT.

October Term, 1924. No. 3160 (List No. 49).

United States,
Appellant,

v.

Chemical Foundation, Incorporated,
Appellee.

And afterwards, to wit on the 10th, 11th and 12th days of November, 1924, come the parties aforesaid by their counsel aforesaid, and this case being called for argument sur pleadings and briefs, before the Honorable Joseph Buffington, Honorable Victor B. Woolley and Honorable J. Warren Davis, Circuit Judges, and the Court not being fully advised in the premises, takes further time for the consideration thereof,

And afterwards, to wit, on the 26th day of March, 1925, come the parties aforesaid by their counsel aforesaid, and the court, now being fully advised in the premises, renders the following decision:

IN THE UNITED STATES CIRCUIT COURT OF APPEALS, FOR THE THIRD CIRCUIT.

October Term, 1924. No. 3160.

United States of America,
Complainant-Appellant,

v.

The Chemical Foundation, Incorporated,
Respondent-Appellee.

ON APPEAL FROM THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF DELAWARE.

OPINION OF THE UNITED STATES CIRCUIT COURT OF APPEALS.

(Filed March 26, 1925.)

Before BUFFINGTON, WOOLLEY and DAVIS, *Circuit Judges.*

WOOLLEY, *Circuit Judge.*

This suit was instituted by the United States of America against The Chemical Foundation, Incorporated, by direction of President Harding, on a bill in equity filed September 8, 1922 in the District Court of the United States for the District of Delaware. The Government in its bill declares upon the Act of Congress approved October 6, 1917 (40 Stat. 411), known as the "Trading with the Enemy Act," and its several amendments, particularly those of March 28, 1918 (40 Stat. 460) and November 4, 1918 (40 Stat. 1020), creating the office of Alien Property Custodian and authorizing the seizure of property of enemy aliens and its

disposition at public sale, or at private sale if the President, in the public interest, should so determine. The Government charges by the bill that certain persons and corporations engaged in the dye and chemical industry desired to acquire the great number of American patents, copyrights and trade-marks owned by German enemies and thereby obtain a monopoly of the dye industry of the United States, and that, pursuant to a scheme or conspiracy into which they entered, the Alien Property Custodian seized approximately 4500 of such patents and many copyrights and trade-marks and sold them at private sale to The Chemical Foundation, a corporation of which he was an officer and whose stock was held by the persons and concerns that had instigated the seizure and sale. It avers that in making the sale the Custodian exceeded all powers conferred upon him by the statute; that his act was in effect a confiscation of property by one other than Congress where alone such power resides, and that the transfer of the patents to the corporation was a donation or subsidy given to a private industry without authority of law; that the Custodian, a public official, in selling the patents to a corporation of which he was an officer and in which he had an interest, violated principles of equity applicable to sales by fiduciaries, whether public or private, and that he, with others, violated Section 41 of the Criminal Code; that if the Custodian was authorized by the statute to sell seized property at private sale, in this transaction he lacked the authority of the President of the United States, who alone might determine when in the public interest a sale otherwise than public should be made; and that, aside from questions of power and authority and fidelity, the sale was irregular in many particulars, especially in that the price was merely nominal, that it was arbitrarily fixed without reference to value, and was grossly inadequate. Maintaining that

for these reasons the sale and assignments of patents, copyrights and trade-marks were illegal, the Government by its bill prays that the court declare them void and require The Chemical Foundation to cancel all instruments of conveyance and return the properties to the United States and account for the revenues derived from them during the period of its possession.

The defendant, by its answer, traversed most of the allegations of the bill and made several specific defenses, namely; want of equity, because of which it moved to dismiss the bill; laches and acquiescence on the part of the Government; and justification of the sale on the ground that it was made to promote the interests of the dye and chemical industry of the United States and thereby to establish a national defense in chemical warfare. The Government moved to strike out parts of the answer and particularly the part on which the defense of justification was set up. The court declined to entertain either motion at that stage and directed the parties to proceed to trial.

The case came on for hearing before the District Court on June 4, 1923 and ended on the twenty-third of July, with a record of 9000 pages. It was argued in October of the same year. On an opinion by the trial judge, filed January 3, 1924, holding adversely to all contentions of the Government, the court, on February 18, 1924, entered a decree dismissing the bill. 294 Fed. 300. The case is here on the Government's appeal. This is a summary of the litigation.

We now come to the story of the case, for every case has a story. This case, however, has two: One told by the evidence as the attorneys for the Government read it and the other told by the evidence as we read it. Believing that the contrast will bring the issues sharply into view, we shall give both. In reciting the Government's story we shall (in our desire to state its case on the facts precisely as it sees it) use the words

of its brief as nearly as we can and the words of the transcribed stenographic notes of the oral argument made by the Special Assistant to the Attorney General, upon whom devolved the opening on this appeal. Greatly compressed, it is as follows:

On January 13, 1919, A. Mitchell Palmer, the Alien Property Custodian, held a conference with his heads of departments with reference to a discussion between himself and the Federal Trade Commission having to do with issuing licenses under German patents upon authority of the Trading with the Enemy Act. As a result of that conference Mr. Palmer filed with the department a memorandum showing his interpretation of the amendment in respect to the seizure and sale of enemy-owned patents and laid down the general policy that the Custodian would seize and sell only such patents as form an actual part of an enemy-owned business and which, accordingly, are necessary to enable the purchaser to carry on the business protected by the patents. Two days later, January 15, 1919, Mr. Houget, patent counsel for the Custodian, wrote a long letter to his chief. That letter is the genesis of the transactions out of which this suit arises. Referring to certain extracts of the letter, Mr. Houget states:

> "We have also talked over the matter with the attorneys representing some of the principal chemical industries in the country to get, if possible, the bulk of an industry which would be vitally effective by our proposed program."
>
> "My recollection of your agreement with General Fort (Chairman of the Federal Trade Commission) is that we then had no intention of demanding and selling any patents except such as formed an actual part of the business which we had demanded and were selling so as to enable the business to continue what it had previously been doing with the assent and concurrence of the related German company."

"In view of this agreement, and of the attitude of the President towards this entire question, I believe that the power of seizure of patents should not be exercised in any wholesale fashion, but only in connection with establishing American businesses and then only for the most cogent reasons."

"My conferences with the representatives of certain chemical companies indicates a very definite and positive feeling that a very large number of German owned American patents is necessary to the development of and the continuance of the business of American dye and chemical industries, and that it was clearly preferable to obtain a right to offer it under such patents, (whether by purchase or by license), through the Alien Property Custodian rather than through the Federal Trade Commission."

"This being the feeling of the industry and our endeavor being to benefit the industry as a whole—and I believe that the industry itself is best qualified to know how this should be done—I suggest that wherever possible the industry, as represented by the patent counsel for the more important companies of the industry, determine just what patents should be seized. You could then not be accused of seizing patents in wholesale fashion but would be placed in a position of aiding an industry in a manner which it desires to be aided and I think that our position would be better than if we determined ourselves to what extent seizures were to be made."

"We have been offered the very fullest cooperation of the representatives of the chemical industry; they assured me that they would undertake to make any reasonable investigation that we may require at their own expense without any guaranty that they would ultimately become purchasers or licensees."

In a postcript he says:

"Since writing the aforegoing Mr. Garvan (Chief of the Bureau of Investigations) and I had a conference with Mr. Poucher of the duPont Com-

> pany, who states that he believes that the Institute of Dye Manufacturers, an association representing practically all of the dye manufacturers in the country, will make a request to the Custodian that he take and sell the German owned American patents, on the ground that proper protection is not afforded by Federal Trade Commission licenses."

Having stated what the Government represents to be the initial move by Government officials in the offending transaction, we shall do as counsel did at the argument and digress for a moment to give the background of this letter and of the events that followed.

At the time the war broke out the dye and chemical industries in the United States were comparatively small, and a large proportion of their important products was imported from Germany. When the English blockade was established and dye and chemical importations were cut off, there was, as will be remembered, a large and insistent demand for such dyestuffs and chemicals by the American public. In consequence a good deal of embarrassment was caused textile and chemical manufacturers. As a result there almost immediately developed in the United States extensive dye and chemical manufactories. The business grew very rapidly. It increased so immensely during our own period of the war that, before the end, the manufacturers in the United States were not only producing the leading chemical and medical products like salvarsan, neo-salvarsan and novacaine in quantities greater than were needed in this country and better than Germany had produced, but they were in fact producing ninety per cent. of the dyestuff requirements of the textile and other industries of the United States under about sixty groups of licenses of enemy-owned patents granted by the Federal Trade Commission, running for the life of the patents subject to certain postwar adjustments.

It was obvious long before the war closed that, not unnaturally, the dye and chemical manufacturers of the United States should consider what would take place after the war. They were not willing to take the risk of the policy which Congress might adopt on the return of peace and of legislation which might be enacted either as to the disposition of the patents or the protection of the industry. They determined to take measures for their own protection. Accordingly, in July, 1918, they made efforts to induce the Government to establish a licensing system restrictive of importation similar to that employed in England and to impose high tariff duties.

In December, 1918 and January, 1919, after the armistice, the manufacturers became very active. Corporations like the General Chemical Company and the National Aniline Company were consolidated into larger corporations. These corporations then organized themselves into two bodies, one the Dye Manufacturers' Association and the other the American Dyes Institute, unincorporated trade associations, subsequently consolidated into the American Dyes Institute, whose membership embraced concerns manufacturing ninety per cent. of the dyestuffs produced in the United States. Mr. Poucher, the head of the dye department of the duPont Company, was chairman of the Executive Committee of this association.

Returning to the letter of Mr. Houget, of January 15, 1919, the starting point in the Government's case, it appears that from that time there were numerous conferences between representatives of the dye and chemical industries and members of the staff of the Alien Property Custodian.

The principal organization of the Alien Property Custodian was in Washington, but he maintained in New York an office in which there was the Bureau of

Investigations, having in hand the investigation of conditions leading up to seizures of enemy-owned property. Mr. Francis P. Garvan was chief of this bureau, Mr. Joseph H. Choate, Jr. was attached to it in charge of the investigation of the chemical and dye business, and Mr. Ramsay Houget was patent counsel of the Custodian. In the conferences to which Mr. Houget refers in his letter all these gentlemen participated. As the industries had determined to acquire control of the German patents through the Custodian, proceedings to that end were rapidly developed in view of the anticipated early signature to a treaty of peace which might interfere with it. So the representatives of the industries and the New York members of the Custodian's staff arranged a formal conference to be held in Washington on January 27, 1919. At that conference Mr. Mansfield Ferry, general counsel for the Custodian, Mr. Hahn, another counsel, Mr. Choate and Mr. Houget representing the Custodian, were present. Mr. Palmer and Mr. Garvan were absent. On the other side there were representatives of the American Dyes Institute, the National Aniline Company and E. I. duPont de-Nemours & Company. A plan, conceived by Mr. Garvan, for the purchase at private sale of the German dye patents by a corporation to be organized by the Dyes Institute was submitted. In this plan it was the part of the Custodian to obtain permission of the President for a private sale of the patents, the number of which was not known but it was guessed there would be between 1000 and 3000. The value of the patents was not discussed, but it was suggested that, as it cost about $50 to acquire a patent, the price should be based on that cost. Mr. Houget named the figure of $250,000. However, the conference adjourned with an understanding that the Custodian should proceed at once with the seizure of the patents and the price would

be determined later. This was the twenty-seventh day of January, 1919.

Returning to New York, the representatives of the Dyes Institute promptly called a meeting of the Executive Committee which approved the appraisal and agreed to underwrite the cost of listing the patents and arranged that patent attorneys of the National Aniline Company and the duPont Company should be placed in the Patent Office at Washington to do the work.

The plan for the seizure proceeded, beginning early in February, 1919. Lists of the patents intended to be seized were made by attorneys for the industries and the titles to the patents were abstracted by attorneys for the Custodian. In the meantime numerous conferences were held between representatives of the Custodian and representatives of the industries at which the scheme was further developed and the price of $250,000 was finally agreed upon, although the number of patents to be sold was yet unknown and no steps had been taken to ascertain their value. Moreover, the terms of the sale were framed so as to exclude all competitive bidding. Members of the Dyes Institute representing nearly all of the dye producers of the country agreed to underwrite the entire capital stock of the proposed purchasing corporation. This accomplished, the Custodian, on February 21, 1919, signed a formal demand for a number of the listed patents and presented it to the Commissioner of Patents. This constituted a seizure. By like demands seizures of other patents were made on March 4 and April 9.

Mr. Garvan, still Chief of the Bureau of Investigations, then appeared before the Sales Committee of the Custodian and submitted the plan to it. This committee was established by Mr. Palmer when, as Custodian, he was given power to sell enemy-owned property. It

was in fact a sales organization, established with the knowledge and approval of President Wilson, with power to make regulations for the guidance of the Custodian and to approve his transactions of sale. This committee consisted of Mr. Otto G. Bannard, Mr. George D. Ingraham, Mr. Stone and two others, men of standing in the business and of wide knowledge and high character. They had power to pass upon all sales with special reference to the purchasers, the adequacy of the consideration and as to their general propriety. The plan was submitted to this committee before the patents had been seized, the price fixed, or the corporation organized. The committee approved it. Further, the members of the committee consented to act as voting trustees of the stock of the proposed purchasing corporation. At another conference between representatives of the industry and Mr. Choate, Mr. Houget and Mr. Garvan, it was agreed that Mr. Garvan, then Chief of the Bureau of Investigations, should become President of the corporation, that Mr. Choate should obtain its charter (for which service later he received a substantial fee) and that he should be its general counsel, and that Mr. Houget should be its patent counsel, (in which position later he received very large fees).

On February 19, 1919 the charter of the corporation, known as The Chemical Foundation, Incorporated, now the defendant in this suit, was filed in Delaware with nominal incorporators, that is, local people and clerks in the office. The corporation was organized on March 3, 1919, when the informal incorporators subscribed to the minimum capital stock and transferred their subscription rights to Mr. Garvan, Mr. McKay and Mr. Corbitt, who were elected directors of the corporation in their places. The remaining shares were subscribed by chemical manufacturers interested in the

patents at the rate of two shares of common stock each with varying amounts of the preferred stock. The first meeting of the directors was held on March 8, 1919. Up to this time Mr. Palmer, the Alien Property Custodian, does not apear on the record at all. He testified, however, that he discussed this matter constantly with Mr. Garvan and that all the proceedings had his approval.

On February 26, 1919, Mr. Palmer appeared for the first time in the transaction and he appeared then because up to this point the necessary authority for the Custodian to dispose of the patents to the proposed corporation at private sale had not been obtained from the President. By an order of December 3, 1918, the President, before going abroad, vested in Frank L. Polk, then Counsellor of the State Department, the power which Section 12 of the Act, as amended, gave the President to determine when in the public interest a private sale should be made. The executive order did not purport to vest this authority in the official or in the office but in Mr. Polk personally. The President returned from Europe on February 25, 1919. On the next morning Mr. Palmer addressed a communication to Mr. Polk enclosing an executive order for him to sign, authorizing the private sale of the patents. Mr. Polk, though in ignorance of the whole matter, signed the order. On March 4, 1919, Mr. Palmer resigned as Alien Property Custodian and on March 5 became Attorney General of the United States. On the day of his resignation, the President, on Mr. Palmer's recommendation, appointed Mr. Garvan Alien Property Custodian. On March 8, pursuant to the previous arrangement, Mr. Garvan became President of The Chemical Foundation and from that date was both President of the corporation purchasing the patents and Alien Property Custodian making the sale, and in these wholly opposite official positions determined the price which

should be paid by one of his principals and received by the other. Moreover, Mr. Choate, counsel in chief of the Chemical Division of the Bureau of Investigations, became general counsel for the purchasing corporation, and Mr. Houget, patent counsel for the Custodian, became patent counsel for the corporation, and the five members of the Advisory Sales Committee, who, acting for the Government, had passed on the sale, became the voting trustees of the stock of the corporation.

Early in April seizure of the remainder of the listed patents was made and on April 10, in completion of the unlawful scheme or conspiracy, approximately 4700 patents and a large number of copyrights and trade-marks, amounting to more than 6000 in all, were formally assigned to The Chemical Foundation for the consideration of $250,000, and this in face of the known fact that during the previous year licenses of a relatively small number of the same patents granted by the Federal Trade Commission had yielded a revenue of $300,000 and of the fact generally known that some of the patents assigned were worth many million dollars. This, briefly, is the Government's story.

With entire respect for the way in which the eminent counsel for the Government read the record, we are constrained to say that the evidence reveals to us a very different transaction—different in origin, purpose, conduct and achievement. Much of the evidence, and particularly that which concerns the negotiations of sale and the naming of terms, is not disputed. The controversy centers mainly on the inferences properly to be drawn.

Before stating the case as it appears to us it will be necessary to give the background against which stand out the acts and motives of the men in the transaction. In order to do this we must advance a step further in our examination of the Trading with the Enemy

Act. This Act, as we have said, was approved October 6, 1917, six months after the United States had entered the war. As originally enacted it provided, among other things, for the seizure and administration of "enemy-owned" money and property in the United States. To this end it defined the word "enemy," (Sec. 2); authorized the President to exercise "any power or authority conferred by this Act through such officer or officers as he shall direct" (Sec. 5, a); created the office and provided for the appointment by the President of the Alien Property Custodian (Sec. 6); required all persons in the United States to report to the Alien Property Custodian enemy-owned poperty in their custody (Sec. 7, a); provided for the seizure of enemy-owned property by authorizing the President to require the payment and delivery thereof to the Alien Property Custodian (Sec. 7, c); prescribed methods by which anyone not an enemy or ally of enemy might recover property mistakenly seized (Sec. 9); gave authority to the President to grant licenses under enemy-owned patents to citizens of the United States, later exercised by him through the Federal Trade Commission (Sec. 10); authorized the administration of seized property by the Alien Property Custodian under Presidential supervision; and postponed until after the war settlement of any claim made by an enemy to seized property (Sec. 12).

While this law authorized the President in his discretion to take over enemy property, it constituted the Alien Property Custodian a mere custodian or conservator thereof, permitting him, under Presidential supervision, merely to hold, preserve and manage it as a "common law trustee," and to dispose of it by sale only "when necessary to prevent waste, and to the end that the interests of the United States in such property and rights, or of such person as may ulti-

mately become entitled thereto, or to the proceeds thereof, may be preserved and safeguarded."

It is clear that the law as originally enacted was purely one of conservation. In consonance with its policy, Mr. A. Mitchell Palmer, who had been appointed Alien Property Custodian, issued an official statement assuring the public that enemy-owned property would be carefully preserved.

When the law was enacted and this announcement made there was little knowledge of German investments in the United States. They were known to be large but they were not suspected as being hostile to American interests. But this idea was quickly dispelled. Responding to the mandate of the Act, persons and corporations in the United States having enemy-owned property in their custody made 35,000 reports of such property to the Custodian. These reports showed property of more than $500,000,000 in value, extending into every state in the Union and the territories and insular possessions, affecting every industry and monopolizing some. It was the Custodian's duty under the statute to take over and operate this huge aggregation of property and it at once became apparent that he was earning large profits as manager of enemy-owned businesses. Many of these were engaged in the manufacture of articles necessary for the war. Enemy-owned textile mills were profitably manufacturing army uniforms, and enemy-owned machine shops were profitably turning out ordnance. The ultimate outcome seemed plain. If, after the war, enemy-owned property and its earnings were to be returned to enemy-owners, they would reap huge war profits which the Custodian had made for them.

It was also quickly revealed that all enemy-owned property was not property of casual private German investors but, on the contrary, was in large part owned

by the Junker class and no inconsiderable part was owned by the Royal Family and by the Kaiser himself. It also developed almost at once that a large portion of the property had definite hostile effects upon the interests of the United States. These are examples:

The Orenstein Arthur-Koppel Co., a great German firm engaged in the business of installing inside railways in industrial plants, had for twenty years been competing for plant equipment all over the country on plans and specifications which were forwarded to their office in Berlin and thence to the German Government.

A number of German-owned fire insurance companies had accumulated plans of industrial plants which likewise were forwarded to their home offices and thence to the proper German bureaus.

The Bosch Magneto Company manufactured special apparatus for aeroplanes. Before the entrance of the United States into the war it had made contracts (in some instances through American concerns) to supply such appliances to the Allies. In complicity with Privy Councillor Albert, the German financial representative in the United States during the early [illegible]ried of the war, it succeeded by a policy of deception and delay in postponing deliveries for fifteen months.

Employees of the Hamburg-American Line and the Nord-Deutsche Lloyd, German-owned steamship lines, kept close watch on the maritime business of the United States and reported to the German Government every ship and its cargo leaving these shores.

The Florida Lumber Company had acquired every advantageous place on the finest harbor in the Gulf of Mexico, the nearest harbor on American soil to the Panama Canal. Its files instead of containing matters pertaining to the lumber business were filled with Pan-German literature. The lumber plant was a distributing center of propaganda.

Other concerns cornered the market in coal tar products that were convertible into explosives in order to hamper the manufacture of munitions. Their achievements in acquiring essential chemicals were regarded by the German authorities as equivalent to the destruction of a train of four hundred cars loaded with explosives.

Among the industries in this country which the Custodian discovered were completely owned by German enemies was the chemical industry dealing principally in medicinals and dyestuffs. As this industry is the center of the controversy here in suit we must pause still further to inquire into its character and its relation to the United States.

The character, operations and magnitude of the German chemical industry prior to the war and during the war and the size and position of the American chemical industry during the same period appear in the record at great length and are admirably condensed in the chapter on the chemical industry prepared by Mr. Choate and contained in Mr. Palmer's report to the President of February 15, 1919, and transmitted by the President to Congress on March 1, following. Though vitally pertinent to the questions here involved we shall be able to sketch only in the barest outline this mass of facts.

Before the war the manufacture of heavy chemicals, such as sulphuric acid and nitric acid, was well developed in this country. These products, being of relatively simple composition, were easily made; and being cheap to produce and expensive to transport, they were profitably manufactured in any given locality. Due to cheap electric power the electro-chemical industry was also well developed. For well-known reasons the oil industry had attained full growth. But in the great field of organic chemistry the United States

was entirely dependent upon the Germans, who had a world monopoly.

This position of the United States was due to a variety of circumstances: The Germans had started early in the industry and had made amazing strides; they had formed great trusts, or kartels, with the approval of their government, and with government aid they were able to enter our markets and destroy or thwart such feeble competition as from time to time arose or struggled on. By practices of "full line forcing," foremen bribery and "dumping" they consolidated their control. But, more important than all, they applied for and obtained several thousand American patents which it was supposed blanketed the art of organic chemistry and the essentially related art of by-product coke ovens in this country.

Organic chemistry is the chemistry of carbon and its compounds. Carbon differs from other elements in that instead of combining with a few other elements in a few definite proportions it will combine with numerous other elements in almost unlimited proportions. The result of this extraordinary facility of combination is that the chemistry of carbon involves a study and production of a multitude of totally diverse products. The importance of this branch of science is due chiefly to the fact that organic chemistry is the chemistry of life. Almost all the chemical substances found in living bodies are organic products, and at one time it was supposed they could be produced only by some action of the principle of life. But about the middle of the last century urea, one of the most well-known organic compounds, was produced synthetically out of coal tar. From this it was conceived that every compound which enters into the body structure can be reproduced synthetically by processes of organic chemistry. Next grew the thought that all diseases are the

result of poisons produced in the system, usually by germs, and these being susceptible of identification may be neutralized or destroyed by appropriate chemical compounds. For example, salvarsan, an organic chemical product originally made in one of the great German dyeworks, is a synthetic product which definitely and positively neutralizes the poison of syphilis.

It happens that the only industry that calls into play resources of this kind is the dye industry. Its base is coal tar and its output is a most extraordinary variety of products. The dyemaker starts with ten well-known "crudes"—toluol, benzol, phenol, cresol, and others—found in coal tar and nowhere else, and converts them by given processes into about three hundred complex compounds appropriately named "intermediates," and by variations of processes these are converted into other intermediates, and these into still others, and so on indefinitely until, finally, innumerable finished products consisting of perfumes, photographic chemicals, tanning materials, medicinals and dyes of many thousand colors are produced. Thus it will be seen that the chemical industry is probably the most complex industry calling for unusual qualities in the men who direct and partake of its activities.

Intermediates being unfinished products (as the name denotes) are of no particular use in themselves and have no commercial value except when sold to other chemical producers for further treatment. But they are of the highest importance in the industry because slight variations in their development make great differences in the finished products. Therefore it is in the proper handling of such sensitive compounds that the genius of the inventor and the skill of the operator are most severely tested.

"But if organic chemistry is the science of life, it is also the science of death." Every one of the great

explosives and every one of the great modern war gases is an organic product. Their base is coal tar, a by-product obtained in the modern manufacture of coke. Otto Coking Co. v. Koppers Co., 258 Fed. 122. It is now realized that the striking power of a nation is in proportion to its supply of coke by-products. Germany's initial strategy in the war was based in part on this fact as was evidenced by its first act of seizing Belgium and Northern France where there were more by-product coke resources (outside of its own) than in all of Europe. These, when combined with its own, gave Germany control of coke by-products vastly greater than were to be found in all the rest of the world.

Coal tar, as we have said, is the base of the dye industry, and finished explosive products are obtained by slight variations in the intermediates produced in the development of dyes. For example, trinitrotoluol (T. N. T.),—picric acid and tetryl,—is produced by the ordinary dye process, in dye apparatus, by dye workmen, from toluol, a coal tar crude. The intermediate from which it is produced (P. N. T.) was for many years a dead product, but the Germans discovered that it could be made into T. N. T. Picric acid is itself a useful dye; and in the long process of manufacturing sulphur black, the most largely used dye (except indigo), a slight variation of the final step will turn the product, at will, into either the black coloring matter or the high explosive.

The war value of the organic chemical industry is even more apparent in the field of poison gases. The war just ended was mainly a chemical war. In the last of the fighting more than half of the shells fired contained gases. It is fair to assume that, even if no further advances are made in chemistry, the next war will begin where the last left off.

As in the case of explosives, poison gases are the product of the materials, apparatus, processes and technique found in dyeworks and nowhere else. It is equally true that protective defenses against gas attacks, such as the chemicals used in gas masks, have been discovered and developed in dyeworks. Hence, dyeworks in times of peace are potential munition plants maintained and equipped to become, in the event of war, actual munition plants on almost a day's notice. Germany demonstrated that munition plants based on an organic chemical industry can be effectively created and maintained in no other way. Having no such industry when it entered the war, the United States built the Edgewood Arsenal at a cost of $35,000,000. Though a colossal plant, it is valueless unless vast sums are annually spent, not in maintaining the structure, but in producing organic chemicals and keeping chemists, workmen, foremen and technicians constantly trained that they may know how to carry on the manufacture of munitions when the demands of war come. It was therefore evident to the officials of the national government that a dye industry is a national bulwark in chemical warfare and that in the United States it had become an imperious necessity.

The chemical industry is also one of great importance in times of peace. It is a key-industry. Its products are essential to the woolen and cotton textile industries, to the photographic and phonographic arts, to the manufacture of paper, ink, leather, and a vast number of other products, amounting in the United States to between $2,000,000,000 and $3,000,000,000 annually. Such a position in commerce carries with it corresponding power, as was demonstrated before our country entered the war when Germany (holding the key) exercised its power by trying to force the United

States to cause the British Government to raise the blockade in consideration of a supply of dyestuffs and medicinals to meet the public demand in this country. The President, however, firmly resisted the pressure at home and the insistence abroad.

We shall not repeat the evidence disclosing the power of the German kartels as it affected the United States during the early months of the war further than to show the belief expressed by the German Ambassador at Washington in a cablegram to Berlin:

> "That the stock of dyes in this country is so small that by a German embargo about four million American workmen might be thrown out of employment";

and to quote a reference to the situation made by the German Consul General, Hossenfelder, in a report to his government:

> "I may, however, mention that the cry for help which comes from the world of physicians is becoming louder and louder and more and more insistent."

Nor shall we review the trade practices employed by the German kartels in selling their products in the American market. Though relevant, such matters are secondary to the main consideration of the national defense.

We have made this digression on the subject of organic chemistry because of our conviction that no one can have even an approximate understanding of the case at bar without some knowledge and appreciaity of the United States to meet them.
tion of the conditions of modern warfare and the abil-

Returning to the actors in this case, it was apparent to Mr. Palmer, the Alien Property Custodian, as

time went on, that the mere powers of conservation of enemy-owned property conferred upon him by the Act of October 6, 1917, were wholly inadequate to meet the situation. He laid the problems of his office before committees of Congress and showed them the necessity of going a step beyond conservation and advancing to the sale of seized property. So, Congress, by the Amendment of March 28, 1918, repealed Section 12 of the Act and substituted another section which, beginning with the same words, vested in the Custodian "all of the powers of a common law trustee in respect of all property" that he shall seize, and "in addition thereto" gave him power "to make any disposition (of such seized property) by sale or otherwise. . . ." Continuing, the section, however, placed limitations upon this power, which are "That any property sold under this Act, except when sold to the United States, shall be sold only to American citizens, at public sale to the highest bidder, after public advertisement . . . unless the President, stating the reasons therefor, in the public interest, shall otherwise determine." Under this power, Mr. Palmer sold many seized properties. Before long, however, he discovered that a number of enemy-owned businesses were conducted under enemy-owned patents, and that, consequently, to sell the physical assets without the appurtenant patent rights meant to give the purchaser not a business but a lifeless plant. To remedy this situation he had to have authority to sell patents as well as physical property. Being in doubt as to his power to do this, he asked for an opinion by the Attorney General who replied that the Act, as it stood, did not confer power to seize and sell patents. To overcome that difficulty an amendment to Section 7 c of the Act was drafted and proposed to Congress by Mr. Palmer and, on November 4, 1918, Congress amended the Act by author-

izing the seizure of "patents, copyrights, applications therefore . . ., trade-marks, choses in action, and rights and claims of every character and description owing to or belonging to . . . an enemy or ally of enemy." (40 Stat. 1020.)

The first important exercise of the power conferred by the last amendment arose in respect to the sale of Bayer & Company, Inc. This company represented, as sales agent, the giant concern of Bayer Company of Leverkusen, and had established a considerable manufactory in the United States. To evade taxation by concealment of profits another company had been organized known as Synthetic Patents Company, Inc., all of the stock of which, like that of the Bayer Company, was held by the German parent concern and to which all the American patents of the German house were conveyed. These, about 1200 in number, were dye and chemical patents.

On December 12, 1918, the Alien Property Custodian sold the property of the Bayer Company and the Synthetic Patents Company, including the patents, at public auction to the Sterling Products Company of West Virginia, the highest bidder.

The Sterling Products Company was not known to the Custodian prior to the sale. The German names of some of its officers arousing suspicion, an inquiry was made into the concern. There was the possibility that the plant had been sold to Germans or to men with German connections, though later this was found to be incorrect. Mr. Palmer realized that he had sold to a private corporation a large group of patents with unrestricted patent monopolies; that there was no assurance that the patents might not be reconveyed to the Germans after the war; that the purchaser enjoyed a monopoly of these patents and that thereby if any considerable number of patents were bought by the same

concern a monopoly of Americans might be substituted for that of Germans.

These possibilities were portentious, and it was then that Mr. Palmer (not Mr. Garvan, as the Government maintains) conceived the idea of so disposing of the German patents as to create an American chemical industry.

Shortly after the Bayer sale Mr. Palmer, still alarmed at the possibilities which that sale suggested and believing that something should be done to prevent them from becoming actualities, sent for Mr. Garvan, Mr. Choate and Mr. Houget and laid before them in a general way the ideas which that sale had prompted and requested that they go home, think them over and bring back a perfected plan for his consideration. Testifying as to that interview Mr. Palmer said:

> "The information that I had received had impressed me with the importance of several things in relation to this chemical patent business, all of which were factors in the working out of the problem. The tremendous development of the chemical science and industry for war purposes, as the war had demonstrated, made the chief and largest impression upon my mind. The absolute necessity, as demonstrated by Germany, of having a war industry in this country—I mean having a chemical industry in this country, if we were going to be adequately prepared for the kind of wars the last was showed the next war to be, led me to declare that we must work out some plan by which this German grip upon the chemical industry, so far as it applied to America, must be transferred to a new American industry under such conditions as would safeguard the Government in the use of every product of the chemical industry which it might require for its own safety and protection in the future; that it ought to be built up and developed in such a way that the Government could constantly have the benefit of it.

"That was the one broad phase of the plan that I laid down to these gentlemen. The other was, and it was not my own entirely, but largely the result of the Federal Trade Commission's views and of what I knew to be the general policy of the administration, that in the building up of that industry a plan had to be worked out by which it should be a competitive industry and no monopoly should result from it.

"Now, these were the two big ideas. It was all nebulous in my mind. It was very general and very broad. The purpose was plain. We wanted to build up an American industry in order that the Government and the people should benefit from it. We wanted to do it in a way that would make that absolutely certain forever and in a way that would not result in monopoly. Now, with that broad and general plan these men went out and tried to work out the plan."

Mr. Palmer was corroborated by the testimony of Mr. Garvan, who said:

"He (Mr. Palmer) told us to go off and work out something and come back and report."

Mr. Choate testified:

"I never heard a suggestion of it from outside until after it had been very completely discussed inside the office."

It is pertinent to note that when on the stand Mr. Palmer was not cross-examined, nor was his testimony contradicted. We therefore find that the plan to seize and sell German patents was not instigated by representatives of the industry and that its genesis was not the letter writen by Mr. Houget to Mr. Palmer, bearing the date of January 15, 1919, as the Government maintains, but that it had its birth in the mind of Mr. Palmer in the month preceding.

Mr. Garvan, Mr. Choate and Mr. Houget returned to New York and in obedience to the direction of their chief set about formulating a plan. They conferred with members of the American Dyes Institute and the Manufacturing Chemists' Association. As a business proposition the idea of purchasing the patents with non-exclusive rights made no appeal to the members of the industry but they indicated a willingness to participate in some such plan as a matter of public interest. These representatives of the Custodian had many conferences with the Executive Committee of the Dyes Institute and the Executive Committee of the Manufacturing Chemists' Association, of which Mr. Palmer was regularly informed. He refused to adopt certain proposals, agreed to others, and supplemented those agreed upon by naming conditions and requirements which occurred to him as necessary to insure the purpose he had in mind. Finally, a conference to be held in Washington was arranged, which was the one previously referred to as of January 27, 1919, when representatives of the industry and of the Custodian were present. At that meeting a plan was proposed and agreed to. The terms and conditions of the plan were in the main dictated and in the whole decided by Mr. Palmer. Therefore, we find that the terms of the plan which ultimately resulted in the sale of the patents were not imposed by the industry but were laid down by Mr. Palmer representing the Government. They were in substance these:

That a corporation should be organized to purchase all the organic chemical and related enemy-owned patents; that its stock should be available for subscription to any member of the industry; that its stock, whether common or preferred, should be entitled to not more than six per cent. dividends per annum, and that the surplus, if any, should first be used to redeem the preferred stock and then for the advancement and de-

velopment of chemical science in the United States; that the corporation should be obligated to issue non-exclusive licenses under all its patents to all qualified American manufacturers, upon fair and equal terms regardless of whether the applicant for a license was a stockholder or not; that the corporation's duty should be to hold the patents in trust for American industry and to protect them against infringers; that all the stock of the corporation should be trusteed for seventeen years, that is, as long as the possible life of the patents to be sold; that the trustees who should have plenary powers over the affairs of the corporation, including the election of its officers, should be appointed by Mr. Palmer and thereafter be self-perpetuating; and that the Government should have free non-exclusive licenses for all governmental purposes under all the patents.

At this conference, as previously stated, the price of the patents was not agreed upon, although, contrary to the statement of the Government that "no effort whatever was made to ascertain the value of the property," the subject was carefully considered and all realized the practical impossibility of determining their value with any degree of approximation. Later, Mr. Palmer in dealing with members of the industry strove to obtain the highest obtainable price, but it appeared that under the required conditions and especially under the one which provided for the issuance of non-exclusive licenses, the most that the industry could raise was $500,000. It was thought that at least half of that amount would be required for working capital of the new corporations, involving inevitably the expenditure of substantial sums in patent litigation. That left $250,000 available as a cash consideration to be paid for the patents. The propriety of that sum was seriously considered and discussed and it was finally agreed upon. It should be noted here that at this time

Mr. Palmer, not Mr. Garvan, was Alien Property Custodian, and also that, as of February 15, 1919, Mr. Palmer, the Alien Property Custodian, made full report of the proposed sale and its terms to the President of the United States, who, in turn submitted the report to Congress on the first of March, following.

But before its acceptance could be effected the plan had to be submitted to the Advisory Sales Committee, which, as we have stated, was a committee organized to pass upon all sales made by the Custodian. The members of this Committee were: Honorable George D. Ingraham, former Presiding Justice of the Appellate Division of the First Judicial Department of the Supreme Court of the State of New York; Mr. Otto T. Bannard, President of the New York Trust Company; Mr. Cleveland H. Dodge; Mr. B. Howell Griswold, Jr., senior partner of the banking firm of Brown Brothers; and Mr. Ralph Stone, President of the Detroit Trust Company. These gentlemen were all of the highest standing, were in no way connected with the chemical industry and were serving the Government without compensation. They approved the plan and on the request of Mr. Palmer agreed to serve as trustees of the stock of the proposed purchasing corporation.

In due course a charter for the corporation was filed in Delaware embodying the terms of the plan whose substance we have given and providing a capitalization of $500,000 of which $400,000 was six per cent. cumulative preferred stock and $100,000 common stock also limited to six per cent. dividends.

When the corporation was organized Judge Ingraham of the Advisory Sales Committee and the Honorable George Gray of Delaware, formerly a judge of this court and then retired, drafted the voting trust agreement.

The listing of the patents began in February, 1919, by patent lawyers who were paid with funds tempo-

rarily advanced for the work by the American Dyes Institute and later repaid by The Chemical Foundation. When the patents had been listed, demands were made upon the Commissioner of Patents and by these symbolic acts of capture formal seizures were completed. But before the patents could be sold at private sale and assigned the consent of the President had to be obtained under the amendment to Section 12 of the Trading with the Enemy Act, approved March 28, 1918. Before the President left for Europe he delegated his power under this section of the Act to Frank L. Polk, then Counsellor of the State Department. Mr. Palmer, enclosing an extract of his report to the President showing the proposed plan of sale, wrote a letter to Mr. Polk requesting that he sign the necessary order for the private sale of the patents. Mr. Polk testified that he carefully read the extract of Mr. Palmer's report. Therefore we assume that Mr. Polk knew what he was doing when he signed the order and returned it to Mr. Palmer. This order (and another signed later) purported to authorize a private sale of enemy-owned patents to The Chemical Foundation on the terms we have recited. Moreover, Mr. Palmer testified that in an interview on March 3, 1919, he explained the whole transaction to the President and recommended that, as he was about to resign in order to become Attorney General, the President consider Mr. Garvan as his successor because of his valuable services in the Bureau of Investigations, his familiarity with the chemical industry and in view of the fact that under the plan of Americanizing that industry he was to be President of the purchasing corporation. Mr. Palmer carried with him a blank commission which the President filled in and signed, appointing Mr. Garvan Alien Property Custodian. It is entirely clear from his uncontradicted testimony that Mr. Palmer fully acquainted the President with the proposed disposition of the German pat-

ents and the Americanization of the chemical industry and that it had the President's approval.

(It may be noted that the President had long known the relation of the organic chemical industry to modern warfare. In January, 1916, before the United States entered the war, Mr. Henry B. Thompson, President of the National Association of Finishers of Cotton Fabrics, discussed with him the dependence of the nation upon organic chemistry for its munitions and urged him to do something, at least in the way of tariffs, toward creating an American dye industry for national defense.)

On April 10, 1919, the first of several assignments of patents was made and The Chemical Foundation began business. Other assignments followed. In the meantime certain doubts arose in regard to the transfer of various rights connected with the properties assigned. In order to avoid the possibility of having a question raised in connection with the validity of the sale, the President on February 13, 1920 executed an instrument broadly ratifying the transaction.

We shall not review the great volume of testimony concerning the way in which The Chemical Foundation performed the trusts imposed by the sale. It is enough to say that it granted the United States free licenses for all government purposes under all the patents it had acquired; that it granted licenses on equal terms to all applicants save one; that it received from the licenses very substantial revenues, none of which has it disbursed in dividends and all of which it has expended for the advancement and development of chemical science in the United States; and that its efforts and expenditures are reflected in the progress of the chemical industry in the United States which in 1920, according to a report of the Senate Committee on Finance (not "at the time the sale took place" as the

Government represents), was producing about 90 per cent. of the dyes needed in this country, and in 1922, as shown by a report of the Tariff Commission, was producing 93.5 per cent. This, greatly compressed, is the story of the case told by the evidence as we read it.

We have reached the discussion and shall now review the questions raised by the Government in assigning errors in the decree of the court dismissing the bill. All matters touching the merits of the case will, of course, be laid aside; also all comments on the policy of Congress in its enactments, for with the policy of legislation the courts have nothing to do. We are concerned only with the legality of what was done. The legality of these things depends on questions of power —power of Congress to enact the Trading with the Enemy Act and power of Government officials under the Act to execute the transaction which they put through, and then, if such existed, on questions whether the Government officials lawfully exercised their power.

These questions rest for their solution first on the constitutionality of the Trading with the Enemy Act and next on the meaning of that Act; and its meaning, in turn, depends on the construction properly to be given its terms. Admissions by the Government made in its brief and at the oral argument have materially simplified the issues of this case and have relieved us of the necessity of discussing many matters presented and urged in the District Court. Before construing the statute we shall summarize these admissions:

Addressing itself to the Trading with the Enemy Act and its several amendments, the Government does not question the sovereign power of the United States to seize enemy property as a war measure, and having seized it, it does not question its sovereign power to confiscate it. It admits that the supreme power over the property in this case was in Congress and that Con-

gress could delegate to the Alien Property Custodian power to seize it. Therefore, it admits that the seizure of the patents by the Alien Property Custodian was lawful. It further admitted at the oral argument that Congress could delegate to the Alien Property Custodian power to sell the seized patents and that, if properly exercised, the Custodian could assign the patents and vest complete title in the purchaser, and that thereafter the patents would be free from the power of a court of equity to lay hands on them. Further, the Government admits that a private sale of such property, when authorized by the President in the public interest, would be lawful, and that the determination by the President that such a sale would be in the public interest, being the exercise of discretion vested in him as the Chief Executive, would not be open to inquiry by the courts. It also concedes that it was the policy of Congress, as indicated by the statute, to eliminate enemy-ownership of enemy-held properties in this country and to place those properties in American hands and render them available for the needs of war.

By these admissions on the law, concerning which it is now needless to repeat the discussion into which the learned trial judge was compelled to enter, we are enabled to come directly to the complaints of the Government, which, grouping the assignments of error, it has condensed into six propositions. The first of these, and the most important, is error charged to the trial court "in its construction of the Trading with the Enemy Act, and especially of Section 12 thereof, conferring upon the Custodian power of sale of property in his custody pending final disposition thereof by Congress." The very center of this controversy therefore is Section 12 of the Act. As originally enacted it read as follows:

> "The alien property custodian shall be vested with all the powers of a common-law trustee in re-

> spect of all property, other than money, which shall come into his possession in pursuance of the provisions of this Act, and, acting under the supervision and direction of the President, and under such rules and regulations as the President shall prescribe, may manage such property and do any act or things in respect thereof or make any disposition thereof or of any part thereof, by sale or otherwise, and exercise any rights which may be or become appurtenant thereto or to the ownership thereof, if and when necessary to prevent waste and protect such property and to the end that interests of the United States in such property and rights or of such person as may ultimately become entitled thereto, or to the proceeds thereof, may be preserved and safeguarded. . . . The alien property custodian shall forthwith deposit in the Treasury of the United States, as hereinbefore provided, the proceeds of any such property or rights so sold by him."

The basic considerations which moved Congress to this legislation were, in its own words, "the safety of the United States" and "the successful prosecution of the war." These vital objects appear throughout the Act and its subsequent amendments. At the time the law was enacted this country had but lately entered the war and it was uncertain just what was necessary for the safety of the nation and the successful prosecution of the war in respect to trading with the enemy. Therefore the law as originally enacted contemplated nothing more than taking and holding enemy property and was a purely conservation measure. On this everyone agrees. Also, everyone concedes that upon the seizure of enemy property under authority of the Act the title of the enemy-owners passed out of them. Passing out of them, it went somewhere. The Act, however, does not say where the title went, that is, whether it vested in the Custodian or in the United States, or whether

the legal title vested in the Custodian and the equitable title in the United States. This question is academic to the issues here involved and does not call for decision, for, in any event, the United States reserved to itself the whole beneficial interest and gave the Custodian "powers" over the property. As to these powers the statute said that "in respect of all property . . . which shall come into his possession in pursuance of this Act," the Custodian "shall be vested with all the powers of a common-law trustee," meaning by that inartificial expression, we imagine, the powers of a trustee in equity. The powers of a trustee are always limited by the instrument creating the trust, so here the Custodian's powers were limited by the Act to conservation of the property and extended to its disposition by sale only when necessary to prevent waste. It authorized him to hold, manage and protect it "to the end that the interests of the United States in such property *or* of such person as may ultimately become entitled thereto, . . . may be preserved and safeguarded." The purposes for which, in the alternative, the Custodian as trustee was authorized to hold seized property are significant, for they show quite clearly that as of that date (October 6, 1917) Congress had not determined what it would do with property thus seized under its war power. So, by Section 12 it said in effect that, except when sold to prevent waste, the Custodian shall preserve and safeguard the property for the United States or (using the disjunctive) for anyone else who ultimately may become entitled to it. Congress further indicated its uncertainty as to what disposition of seized property it would ultimately make by providing in a later paragraph in the same section that:

> "After the end of the war any claim of an enemy or of an ally of enemy to any money or other property received and held by the alien prop-

> erty custodian or deposited in the United States Treasury, shall be settled as Congress shall direct."

Thus, by the Act of October 6, 1917, Congress carefully reserved to itself complete freedom of action in the future.

But Congress concluded, as it had full power to do, not to wait until "after the end of the war" to determine who should be entitled to seized enemy-property —whether previous enemy-owners or the United States. So, on March 28, 1918, Congress, to meet the problems of the Alien Property Custodian and to strike a blow at the enemy in the darkest hour of the war, determined that question then and there by repealing Section 12 and enacting a new section in its place.

"When the law distinguishes we look for some difference," and when a legislative body repeals one provision of a statute and substitutes another we also expect to find some difference in the provision newly enacted and the provision repealed and also some difference in the situations from which the two provisions arose and in the purposes intended to be effected first by one and then by the other. And such difference in situation and purpose is clearly disclosed.

The Amendment repeats substantially the words of the original section down to the word "Act," vesting the Alien Property Custodian "with all of the powers of a common-law trustee in respect of all property" coming into his possession in pursuance of its provisions, and then in new words continues:

> "and in addition thereto (that is, in addition to the powers of a common-law trustee), acting under the supervision and direction of the President, and under such rules and regulations as the President shall prescribe, (the custodian) shall have power to manage such property and do any act or things in respect thereof or make any disposition thereof

> or of any part thereof, by sale or otherwise, and exercise any rights or powers which may be or become appurtenant thereto or to the ownership thereof in like manner as though he were the absolute owner thereof: Provided, That any property sold under this Act, except when sold to the United States, shall be sold only to American citizens, at public sale to the highest bidder, after public advertisement of time and place of sale which shall be where the property or a major portion thereof is situated, unless the President stating the reasons therefor, in the public interest shall otherwise determine: . . . The alien property custodian shall forthwith deposit in the Treasury of the United States, as hereinbefore provided, the proceeds of any such property or rights so sold by him. . . .
>
> "After the end of the war any claim of an enemy or of an ally of enemy to any money or other property received and held by the alien property custodian, or deposited in the United States Treasury, shall be settled as Congress shall direct."

It is evident that by this amendment Congress transformed the Trading with the Enemy Act from a purely conservation measure to one of action, definite and drastic. It no longer left the ultimate disposition of seized enemy property in suspense but determined its disposition with finality. While it gave the Custodian the same custodial powers which it had previously vested in him, Congress gave him additional powers over seized enemy property to meet a war situation which had arisen since the date of the original enactment and to meet other war situations as they should arise in the future. It did not limit these powers to the sale of the seized property but gave the Custodian the broad "power to . . . make any *disposition* thereof,"—dis + ponere, to displace. As though this were not enough, the provision continues: "dispo-

sition thereof, by sale or *otherwise.*" As we are not presently concerned with a disposition of seized property otherwise than by sale, we advert to the word "otherwise" in the power merely to observe that Congress, seeking to confer very broad powers upon the Custodian, authorized him to dispose of the property in ways other than by sale. But when disposed of by sale Congress sought to confer upon the Custodian still broader powers by using terms which in themselves seem to confer a power almost without limit. They are: "power to . . . make any disposition thereof, by sale or otherwise, . . . in like manner as though he were the absolute owner thereof." Had the section stopped here we are clearly of opinion that the power thus conferred, if properly exercised, would embrace the disposition of the patents by a sale of the kind in controversy. But, in the next words, the section tentatively limits "disposition . . . by sale" by providing "that any property sold under this Act, except when sold to the United States (the latter phrase indicating still further the breadth of the Custodian's power of disposition) shall be sold only to American citizens, at public sale to the highest bidder, after public advertisement. . . ." Obviously, these are limitations on the Custodian's power of disposition by sale, and had the section ended here the transaction of sale in the case at bar would, of course, be invalid. But the section immediately withdrew these limitations by making an exception, which is that seized property "shall be sold only to American citizens, at public sale to the highest bidder, after public advertisement. . . . , *unless* the President stating the reasons therefor, in the public interest, shall otherwise determine." When the President had otherwise determined, as we shall assume for the moment he did in this case, the effect of his determination "other-

wise" was, as we construe the statute, to annul, for the occasion, the limitations of the Custodian's power to dispose of seized property at public sale to American citizens at the highest bid after advertisement and leave him with all the "power to . . . make disposition thereof, by sale or otherwise, . . . in like manner as though he were the absolute owner thereof,"—just as though the quoted paragraph giving him this power had come to an end at the point immediately preceding the limiting provisos.

The question is therefore reduced to this: Having received the President's authority, did the first paragraph of Section 12, as amended, give the Custodian power to dispose of the patents to the respondent at private sale upon the conditions and for the consideration named? The Government says it did not for a number of reasons; first, for the reason that, as it interprets the section, "the change of policy with respect to sale of enemy property embodied in the Amendment of March, 1918, did not change the policy of conservation but only authorized a conversion of property into cash while in custody, reserving to Congress the determination after the war of all questions as to final disposition thereof." Conceding that it was the policy of Congress to eliminate German ownership and put the seized properties of Germans in American hands and render them available for war, the Government nevertheless maintains that "this policy could and was intended to be fully carried out and this purpose completely accomplished by fair sale of this property to American citizens, and by the substitution therefor of its fair equivalent *in cash* in the hands of the Treasurer of the United States." Stated differently, the contention of the Government is that, "the property in the hands of the Custodian was held with the enemy interest in suspension awaiting the final

action of Congress as to the disposition thereof after the war. If Congress intended to return it or its proceeds to the original owners, no beneficial interest therein would ever have accrued to the United States or the people thereof . . . ; Congress has never created any trust of this property for the benefit of the nation and could not do so out of property which had never been acquired by confiscation or otherwise and which was not owned by the Government." Using its words, we think this fairly states the position of the Government, and it is based on two propositions, either one of which, if sound, sustains its conclusions. The first is that the Custodian, even without the descriptive words of the section, is a fiduciary, subject to all the familiar duties and obligations of an ordinary trustee; that the powers of a "common-law trustee" with which the amended section vested the Custodian charged him with the duty to conserve the estate just as the original section did, and that the additional power conferred upon him by the amendment—the power to sell seized property—was subordinate to and therefore was to be exercised in consonance with his trusteeship; and that as an ordinary trustee in equity can sell trust property only for money, and only for the largest amount obtainable, the Custodian was bound to sell the seized patents at a price which would bring the largest return in dollars and was not authorized to be influenced by other considerations, however advantageous they were to the United States, or, even though they affected the life of the nation. We think there is infirmity in this premise and that, in consequence, the syllogism is faulty. The statute provides for public sale to the highest bidder "*unless* the President, stating the reasons therefor, in the public interest, shall otherwise determine." The inevitable logic of this provision is that when the President shall, in

the public interest, determine otherwise, seized property may be sold at private sale to a lower bidder. This expression of the section contemplates something more than money because by its terms it calls upon the President to regard the public interest in departing from the statute's general rule of public sale. Public interest is not limited to dollars. When therefore in the public interest the President authorizes a private sale, the statute permits the Custodian to dispose of the property "in like manner as though he were the absolute owner thereof." An absolute owner is at liberty to consider and impose conditions of sale and to be influenced by something other than the monetary return. It is common knowledge of all lawyers and many business men that the highest bid is not always the best bid and that a lower bid may be the best bid when based on conditions sufficient to overbalance the difference between the two. And so here, concededly, the patents were sold for less than their value to their previous German owners, and perhaps less than their value to the United States had they been offered at public sale without conditions, for then the purchasers would have acquired them with their characteristic of monopolies in force. But when the President determined that the public interest required that they should be sold at private sale, it was, we surmise, lawful for the Custodian in fixing the terms of the sale to keep the public interest in mind, as he did in this case, and impose conditions which would be not only advantageous to his principal but would carry out the express purpose of the Act by assuring "the safety of the United States." With these conditions announced it is obvious that the money price would be less than the price which would be obtained at a sale without conditions.

So long as the Custodian had seized property in his hands, and until he had disposed of it under the

new powers given him by the amendment, he was, of course, bound to conserve it with all the care of a trustee. Property not sold and remaining in his possession was "after the end of the war" subject to ultimate disposition by Congress. But when, before the end of the war, he acted under the powers of disposition newly given him (and under the authority of the President to sell otherwise than at public sale), he was, by the new instrument of trust as we may call it, relieved of his custodial duties, and was authorized to sell the property free of any trust for a price and on such terms and conditions as, under the President's supervision, he should decide upon; and on such a sale, in the absence of fraud, all title to the property passed to the purchaser,—not to be divested "after the end of the war."

The other proposition which the Government advances against this sale under the statute is that to divest enemy property of enemy interests and vest it in the Custodian with full power of final disposition, the enemy property must first be confiscated; that power of confiscation resides in Congress alone, and that Congress never having confiscated the patents in question, their sale by the Custodian in the public interest was in effect a confiscation by him. We are not persuaded to this view because two things had happened: First, Congress, knowing that enemy property cannot be condemned without an act of Congress, Brown v. United States, 8 Cranch. 110, enacted the Trading with the Enemy Act as a strictly war measure, having its sanction in the Constitutional Provision, Art. I, Section 8, Cl. 11, empowering the Congress "to declare war, grant letters of marque and reprisal, and make rules concerning captures on land and water." Commercial Trust Co. v. Miller, 281 Fed. 804; Miller v. United States, 11 Wall. 268, 305. Congress could not

physically make captures of enemy property itself, so by this Act it created the Alien Property Custodian and employed him as an instrument to that end. Under the Act as originally passed and as amended, Congress authorized him to seize and hold property of enemy aliens. Upon seizure the title of the enemy-owners was not held "in suspension" but passed out of them and became vested, legally or beneficially, in the United States. But this is not all that Congress did. Concluding not to wait until the end of the war to dispose of seized property either by restitution or appropriation, it disposed of it by the amendment of March 28, 1918 in the only way it could, namely; by employing some instrument to carry out its will. This it did by again using the Alien Property Custodian and empowering him, under the supervision and direction of the President, to dispose of seized property at public sale, or otherwise when in the public interest the President should so determine. When the Custodian acted under the power which Congress granted him and under the direction of the President in the public interest, he was a mere instrument selected by Congress to carry out what it had determined should be done. His act was not the exercise of legislative power delegated to him, but was the act of Congress operating through him with the same effect and validity as though Congress itself had made the capture and the sale. Although, admittedly, the Custodian acted under the power only when in his judgment an occasion for its exercise arose, we find no infirmity in this for such action is in consonance with years of practice sustained by a long line of decisions of which the most familiar are: Field v. Clark, 143 U. S. 649; Union Bridge Company v. United States, 204 U. S. 364, 380-3; Monongahela Bridge v. United States, 216 U. S. 177; Buttfield v. Stranahan, 192 U. S. 470; United States v. Grinaud, 220 U. S. 506, 516-21; Se-

lective Draft Law Cases, 245 U. S. 366, 389. The following excerpt from the opinion in Field v. Clark shows the law:

> " 'The true distinction,' as Judge Ranney, speaking for the Supreme Court of Ohio, has well said, 'is between the delegation of power to make the law, which necessarily involves a discretion as to what it shall be, and conferring authority or discretion as to its execution, to be exercised under and in pursuance of the law. The first cannot be done; to the latter no valid objection can be made.' Cincinnati, Wilmington &c. Railroad v. Commissioners, 1 Ohio St. 88. In Moers v. City of Reading, 21 Penn. St. 188, 202, the language of the court was: 'Half the statutes on our books are in the alternative, depending on the discretion of some person or persons to whom is confided the duty of determining whether the proper occasion exists for executing them. But it cannot be said that the exercise of such discretion is the making of the law.' So, in Locke's Appeal, 72 Penn. St. 491, 498: 'To assert that a law is less than a law, because it is made to depend on a future event or act, is to rob the legislature of the power to act wisely for the public welfare whenever a law is passed relating to a state of affairs not yet developed, or to things future and impossible to fully know.' The proper distinction, the court said, was this: 'The legislature cannot delegate its power to make a law; but it can make a law to delegate a power to determine some fact or state of things upon which the law makes, or intends to make its own action depend. To deny this would be to stop the wheels of government. There are many things upon which wise and useful legislation must depend which cannot be known to the law-making power, and, must, therefore, be a subject of inquiry and determination outside of the halls of legislation.' "

For these reasons we are of opinion that the sale was made by the Custodian within the powers conferred

upon him by the statute and is to that extent valid. It remains to be determined whether in making the sale the Custodian validly exercised his powers.

The Government, by the next group of assignments of error, asserts that, aside from all questions of power, the sale and assignments of patents to The Chemical Foundation "were illegal and void, as being in violation of Section 41 of the Criminal Code of the United States and to those principles of law and equity which forbid a fiduciary to make sale of trust property in his custody to himself or to a corporation of which he is the head." Section 41 of the Criminal Code reads as follows:

> "No *officer or agent* of any corporation, . . . or *person directly or indirectly interested* in the pecuniary profits or *contracts* of such corporation, . . . shall be employed or *shall act as officer or agent of the United States for the transaction of business with such* corporation. . . . Whoever shall violate the provisions of this section shall be fined not more than two thousand dollars and imprisoned not more than two years." (35 Stat. 1097.)

Although this is not a criminal action and the persons charged with violating this statute are not presently on trial, the Government, quite logically, finds it necessary to convict them (potentially at least) in order to sustain its contention that because of their crime the things they did are void.

This is a subject of extreme delicacy. No implications are involved for, quite the contrary, it is based on direct accusations. The Government charges that at the time the sale and assignments of the patents were made (with the exception of the last two) the forbidden relations of the parties conducting this transaction for the Government and for The Chemical

Foundation, the seller and purchaser, respectively, were as follows:

Francis P. Garvan was Alien Property Custodian and President of The Chemical Foundation; Douglas I. McKay was a representative of the Custodian and Vice-President of The Foundation; George J. Corbitt was a representative of the Custodian and Secretary and Treasurer of The Foundation; Messrs. Garvan, McKay and Corbitt, when holding the government positions above set forth also constituted the Board of Directors of The Foundation; Joseph H. Choate, Jr., when Chief of the Chemical Division of the Bureau of Investigations under the Alien Property Custodian, became general counsel of The Foundation; Ramsay Houget was patent attorney for the Custodian and also patent attorney for The Foundation; Otto P. Bannard, George D. Ingraham, Cleveland H. Dodge, Benjamin H. Griswold, Jr., and Ralph Stone, constituting the Advisory Sales Committee of the Custodian were also voting trustees of the common stock of The Foundation. The Government, charging these gentlemen with felony, continues:

> "The mere statement of these facts in the light of the broad and clear language of the statute should, we submit, be sufficient to dispose of this case; to establish the illegality of the transaction in question and the right of the Government to a decree."

We are of opinion that more than this is required, because the criminality of the parties named and the invalidity of the things they did depend first on the law and then on facts not found in the statement.

There is no doubt that Section 41 of the Criminal Code was in force at the time the transaction of sale was consummated, but there is doubt whether that section of the Criminal Code applies to a transaction of

this kind. And this is because Section 7 c of the Trading with the Enemy Act expressly provides that,

> "No person shall be held liable in any court for or in respect to anything done or omitted in pursuance of any order, rule, or regulations made by the President under the authority of this Act."

The learned trial judge held that by reason of this provision Section 41 of the Criminal Code is without relevancy to the acts done, and, hence, without relevancy to the issues in this suit. We avail ourselves of his discussion to show our grounds for arriving at the same conclusion. 294 Fed. 334, 335.

Aside from the law, we are of opinion that, on the facts, the transaction does not come within the offense defined by the criminal section, for these reasons:

In defining the offense the statute discloses that it has several elements; (a) that the offending person shall hold opposite and incompatible positions, in that (b) he shall be an officer or agent of the United States and (c) at the same time an officer or agent of a corporation engaged in a transaction with the United States, and (d) as such he shall be directly or indirectly interested in the pecuniary profits or contracts of such corporation. In searching the transaction for these essential ingredients of the offense, we repeat what we have already found, that the transaction was conceived by Mr. Palmer, that the terms of the sale were dictated by him and that the contract of sale (as distinguished from its performance) was completed by him when he was Alien Property Custodian. This finding may be challenged on the ground that at the time Mr. Palmer was Alien Property Custodian and the contract was made The Chemical Foundation had not been incorporated and therefore it was not in existence. That is true. But it is familiar business practice for persons to negotiate and fully complete contracts for

the benefit of corporations intended to be organized and, of course, not in existence, and the courts sustain such contracts when later the corporations are organized and they assume the contracts. Commonwealth Steamship Co. v. American Shipbuilding Co., 197 Fed. 780, 797; *Id.* 215 Fed. 297; Irwin Glass Co. v. Buchanan, 289 Fed. 348, 350.

When Mr. Palmer made the contract of sale Mr. Garvan was an officer of the United States serving his government without compensation, being one of that class generally known as "dollar-a-year men." He was not then an officer of The Chemical Foundation. When, later, he became Alien Property Custodian and also President of The Chemical Foundation, there was present the element of two official positions, and in these positions it is true he carried out the contract previously made, but there was lacking the element of a direct or indirect interest on his part in the pecuniary profits or contracts of The Foundation, for he agreed to serve as its President without compensation and he has kept his agreement. He has not received from it any money for any purpose, even for his expenses. Moreover, the by-laws of the corporation provide that the President and Vice-President shall serve without pay. Mr. Garvan, together with Mr. McKay and Mr. Corbitt, while holding positions under the United States and at the same time acting as directors of The Foundation, were not holders of the stock of the corporation other than shares placed in their names to qualify them as directors. Therefore, with respect to these three gentlemen there is wholly lacking the element of a direct or indirect pecuniary interest in the profits or contracts of The Foundation.

Coming to Mr. Choate, we find him in the same position with Mr. Garvan in that he was a dollar-a-year man in the service of the Government at the time another (Mr. Palmer) made the contract.

Mr. Houget was an attorney and, like Mr. Choate and Mr. Garvan, was not an officer of The Foundation when the contract was made.

Judge Ingraham, Mr. Bannard, Mr. Dodge, Mr. Griswold and Mr. Stone were all dollar-a-year men when the contract was made by Mr. Palmer and also later when they became voting trustees of the corporation. No one of these gentlemen, and no one of the others just named, owned a single share of stock of The Foundation or was interested in the chemical industry. In consequence all lacked the element of pecuniary interest in the profits or contracts of the corporation. And finally, if the ten persons named violated the cited criminal statute, they did it with the full knowledge and complicity of the other participants —Mr. Palmer, Mr. Polk, Judge Gray and President Wilson. An examination of the evidence, however, makes it clear that at no time did any one of these gentlemen perform acts within the offense defined by the law. It follows that the transaction was not consummated in violation of this criminal statute and therefore it is not invalid on this ground.

The contention that the sale and assignments were illegal and void because in conflict with settled rules and principles of law and equity applicable to such transactions does not, in view of our construction of the Trading with the Enemy Act, call for separate discussion. We have considered it in our discussion of other subjects and shall touch upon it again in connection with another matter.

The Government, by other assignments of error, takes the position that the President did not give the Alien Property Custodian the requisite authority to make a private sale of the patents in question, and, lacking that authority, the sale is void.

On December 3, 1918, the President, on the eve of going abroad, made a number of executive orders ad-

dressed to the Alien Property Custodian, the Federal Trade Commission and Frank L. Polk in one instrument. The part pertinent to this inquiry is the following:

> "V. I hereby vest in Frank L. Polk all power and authority conferred upon the President by the provisions of Section 12 of the said 'Trading with the Enemy Act' as amended. . . .
>
> "WOODROW WILSON."

Under authority of this executive order Mr. Polk made the two orders purporting to authorize the Custodian to make a private sale of the patents to The Chemical Foundation on the terms named, stating the reasons therefor in the public interest. The Government says these orders are invalid because the President's order of December 3 is itself invalid. It challenges the validity of the President's order, first, because it is addressed to a person, not to an official; next, because it is a confidence reposed by him in a person, not in an official; and, lastly, because the President had no right to delegate the authority at all. True, no official designations were made. Yet there can be no doubt as to the identity of the men whose names appear in the order. One was Counsellor of the State Department, the other the President of the United States. To men in such stations, titles add nothing. The solitary name "A. Lincoln" comes to the eye of every student of Civil War literature, as do the names of officers whom that immortal Commander-in-Chief addressed quite informally on grave official matters. We apprehend no one ever questioned the official character of those communications. Moreover, in official intercourse between officers high in the Government service something very definite must appear to induce a finding that a power reposed by one in the other was personal in the sense of a confidence such as a testator reposes

in a named testamentary trustee. There is nothing in the record which indicates that the President in making the executive order of December 3, 1918 reposed a confidence in Mr. Polk personally. Therefore, by every intendment of law it must be found that he contemplated the exercise of his authority by an officer engaged in the same public service.

At all events, the President, by executive order of February 13, 1920, quieted all doubts in this regard by confirming the actions of the Alien Property Custodian taken pursuant to Mr. Polk's orders, and by words sufficiently comprehensive to cover the whole transaction ratified the sale to The Chemical Foundation.

While on the subject of confirmation and ratification we shall briefly dispose of two contentions of The Foundation: One is that the transaction was also ratified by Congress. This is based on the inaction of Congress following its receipt, on March 1, 1919, of Mr. Palmer's report to the President showing the proposed sale to The Foundation and the reasons therefor. Congress cannot be estopped by its silence from exercising its constitutional power of legislation. Nor does the silence of Congress indicate its approval or disapproval of matters coming to its knowledge in the course of its deliberations. The only significance of submitting the report of the proposed transaction to Congress and through Congress to the public is that such an act is unusual for one engaged in a conspiracy against the Government.

The Foundation maintains that the transaction was also confirmed and ratified by the United States in the Treaty of Berlin. We find no substance in this contention. The most that the United States did by the Treaty of Berlin was to recognize, not ratify, the transaction. This is what happened: When the President went to

Paris he took with him a representative of the Custodian intimately informed on all the details of the patent transaction and retained him there throughout the negotiations in order to have the facts of the situation available. By the Treaty of Versailles it was provided that as between the allies and associated powers and their nationals on the one hand and Germany and her nationals on the other hand, all the exceptional war measures, or measures of transfer, or acts done or to be done in execution of such measures (named in certain paragraphs and with reservations not here pertinent) should be considered as final and binding on all persons, Treaty of Versailles, Part X, Art. 297 (d), and that the nationals of each government should look to their own government for the redress of whatever wrongs they had suffered. This covered what the United States had done in respect to German patents. By the Treaty of Berlin, Germany gave to the United States and the United States accepted the benefits of the Treaty of Versailles among which were the benefits of the patent transaction. This action by treaty between Germany and the United States, while significant, would of course not estop the United States, from asserting any rights it may have against its own citizess.

Returning to the President's order to Mr. Polk, the real point of this phase of the case, as we observe it, is whether the President under the Trading with the Enemy Act could validly delegate to another official the exercise of the discretionary powers conferred upon him by Section 12. Certainly he could not, unless the statute authorized him to do so. And this, we think, the statute did.

The war being on, Congress gave the President—the executive of the nation and the Commander-in-Chief of the Army and Navy—war powers and imposed upon him duties which were vast in number and

amazing in magnitude. Conscious that no living man could perform all of them, it authorized him in large measure to delegate those powers and duties to his subordinates. In the field of war activities touching trading with the enemy, Congress by the Act in question imposed particularly heavy duties upon the President and conferred upon him many powers, but by Section 5 of the same Act it said:

> "The President may exercise any power or authority conferred by this Act through such officer or officers as he shall direct."

Mr. Polk was an officer of the United States within the meaning of the Act; a constitutional officer appointed by the President and confirmed by the Senate. Burnap v. United States, 252 U. S. 512, 514-5. The authority thus conferred upon the President to exercise his powers through others was broad. By express terms it included the exercise of "any" power. One of the President's powers was that of determining when, under Section 12, seized enemy property should, in the public interest, be disposed of otherwise than at public sale. If the question of the President's exercise of this war power through another were raised without precedent for its solution we should not hesitate to affirm it, but now the solution of the question is made easier by decisions of the Supreme Court sustaining the delegation of powers and duties committed to the President by this Act which are similar in their quasi-judicial and discretionary character to the one in question. Stoehr v. Wallace, 255 U. S. 239, 244-5; Central Trust Co. v. Garvan, 254 U. S. 554; Commercial Trust Co. v. Miller, 262 U. S. 51, 53; Behn, Meyer & Co., Ltd. v. Miller, U. S. .

We cannot subscribe to the contention of the Government that the power of delegation conferred upon the President by Section 5 is limited to Section 7 (c) of

the Act. We are of opinion that it extends as well to Section 12 as amended.

Having decided that the sale of patents was made under powers conferred by the statute with the authority of the President, and that to this point the transaction is valid, the next contention of the Government is that, even so, the sale is void and conferred no title upon the purchaser because irregular in particulars which we shall briefly note.

These alleged irregularities go mainly to the amount paid for the patents and the conduct of the parties in fixing the price. On these matters there is a mass of testimony whose applicability and probative force are in great confusion, due evidently to the different views of the opposing parties as to the powers and duties of the Custodian in disposing of the patents. The Government says:

> "The consideration of the question here presented is predicated upon the discussion of the provision and construction of the Trading with the Enemy Act,"

and, accordingly, the Government, pursuing its theory that the statute raised a pure trust and stopped there, bases its argument against the irregularities upon the principle that,

> "One fundamental essential of a sale by a trustee or any person occupying a confidential position is that it must be a fair sale in every sense of that word, and the property must be sold under such conditions as will enable it to bring its fair equivalent *in money*."

On this contention the evidence shows one thing. But we have held that even though he had powers of a trustee, the Custodian, "in addition," was authorized by the statute to do what he did. In that situation the

evidence shows another thing. In determining whether the price paid for the patents was grossly inadequate,—the main irregularity charged—it will, therefore, be necessary first to find in what way was it inadequate—inadequate in respect to what, or inadequate in respect to whom?

This will require us to view the evidence from three angles. If, in looking at it in one way, inadequacy of price means that the $250,000 paid was not enough in that it was less than the value of the patents in the hands of their previous German owners, we promptly say the price was grossly inadequate. But the patents passed from the German owners when they were seized, therefore we are not concerned in this case with their value to the Germans. Thus a large part of the testimony on the question of inadequacy of price must be set aside. On leaving the Germans the patents passed to the United States, becoming its property, either legal or equitable. Hence, we must determine their value to the United States, their new owner,—first, at public sale and then at private sale.

In making this inquiry we have constantly kept in mind that the Trading with the Enemy Act expressly directs that when seized property shall be sold at public sale it shall be sold "only to American citizens," and that the transaction of private sale here in question followed that statutory policy and likewise limited the sale to a corporate American citizen. So the value of the patents to the United States was their value in the American market. What was the character of that market at the time? It had but started in the organic chemical art and knew little of the subjects matter of the patents and less of their value. If the patents had been put up at public sale (without restrictions or conditions, and carrying full monopolies) with the single intention that they bring "their fair equivalent in

money,"—this is the second angle,—anyone who contemplated making a bid would have been confronted by the problem normally incident to such matters and, in that particular case, by an abnormal problem as well. The normal problem would have been the worth of the patents.

The true value of a patent, and particularly of an unadjudicated patent, is, from its very nature, difficult, if not impossible, to determine. A patent is valid and therefore valuable only if it cover invention, and invention is involved only if the subject matter be new and useful within the meaning of the term "invention," which is impossible of definition. Again, the thing—mechanism, product, or process—may be "useful" in the sense of invention but not "usable" in a practical sense, and if not usable it therefore may not be valuable. With patents of this class the Patent Office is crowded. John Barker Waite in his treatise on Patent Law (107), from which we quote without intimating an opinion on his words, says:

> "There are, for instance, of record, in the neighborhood of 700 patents for various types of explosion turbines and parts thereof. Yet manufacturers are unanimous in saying that a usable, practicable, explosion turbine can not be built, so far as present knowledge of metals goes. It is evident therefore that these 700 patents are not for 'usable' devices; yet no one would deny that they are valid patents."

Moreover, some of the patents are product patents, that is, patents for products with nothing to show how to make them. More serious still,—such a sale being limited to American citizens,—the evidence discloses that American citizens had at that time very little of the "know how," and hence the process patents meant less to them than to the Germans. Here is

the abnormal problem. Then again, German patents have not always enjoyed the best reputation, Alpha Portland Cement Co. v. Schratweiser, 221 Fed. 258, 259; Rohn, et al. v. Martin Dennis Co., 263 Fed. 388; Seward's Science and the Nation, p. 18, the disposition of German applicants for patents being to make meager and sometimes insufficient disclosures. For example, Dr. Holdermann, who was a member of the German firm which before their seizure owned the Haber nitrogen-fixation patents and who came from Germany to attend the trial of this case, testified that these process patents (fifty-eight in number) are worth $17,000,000, yet the learned trial judge found on evidence which we think abundantly sustains him that, because their disclosures are of doubtful adequacy even to Germans other than those specially trained under the patents, and because their disclosures are wholly inadequate to workers in the chemical art in America, these patents are without substantial affirmative value to American citizens.

This brief discussion of patent values may throw some light on the very real difficulty of fixing prices that might have been paid for the German patents by American bidders if they had been offered at public sale. Difficult as the problem is, we are, nevertheless, of opinion that $250,000, if paid for the outright, unlimited and unconditional purchase of these patents by American citizens at a supposed public sale would be inadequate, and we base our conclusion on the royalties which were being paid and received for some of them in 1919. But the $250,000 paid for the patents in the transaction in question was not paid for an unrestricted and unconditional purchase. Therefore the true inquiry—and this is the third angle—is whether the price was adequate under the terms of the actual sale. Put in another way, assuming that the legal or equitable title

was in the United States, and assuming of course that the United States had a right to full return for its property, was the price adequate? That depends upon how the patents were sold and what the United States got in return. By authority of the Act, which means by authority of Congress, the patents were sold stripped of their characteristic of monopolies and sold on conditions that the United States should have free licenses under all of them and that its citizens should have non-exclusive licenses on equal terms. These, briefly, were the conditions. What did the United States receive? It received the $250,000; it also received licenses under the patents; and it obtained the creation of an industry which stands equipped, manned and maintained in full operation ready to be converted at once into a line of national defense in the event of war. There is no evidence of the value of the licenses which the Government received, nor, very naturally, is there evidence of the value of the national defense in chemical warfare placed in the Government's hands. Yet, we surmise, these things have values, and, taken together, we believe they are greater than the value of the patents at the time of their sale. We are of opinion that the price paid in the circumstances was not inadequate.

We shall not discuss the other alleged irregularities in the sale for, like that of inadequate price, they disappear from the case on our construction of the statute. For the same reason we shall not review the Government's contention that the transaction constituted in legal effect an unauthorized confiscation of property and a donation thereof to private industry in violation of the Constitution and laws of the United States.

The remaining contention of the Government is that the alleged sale and assignments of the patents are illegal and void in that they were induced, brought

about, and accomplished in pursuance and as a result of an unlawful scheme or conspiracy. Early in the trial, the learned judge, realizing the gravity of the charges made and the issues involved in the case, lowered all barriers to the admission of evidence and announced that each party to the suit would be permitted, without regard to the usual rules of evidence, to take and put on record all evidence that, in the opinion of its counsel, would in any manner tend to prove or disprove any issue. Throughout the trial he adhered to this announcement except when on cross-examination the Government sought to bring out and uncover secret processes which certain licensees had, at great cost and labor, developed in attempting to practice the inventions of some of the patents. He ruled—rightly, we think—against such questions.

By this action of the judge in suspending the rules of evidence the way was made clear for the Government to prove the scheme or conspiracy it had charged in the bill. It had charged a conspiracy entered into by "persons, firms, corporations and trade associations and others associated with them in said industry . . . to induce and procure the seizure of enemy-owned patents," etc. Not being satisfied with its progress, the Government during the trial shifted its charge from the persons named in the pleading to the officers of the Government (not named in the pleading) who formulated the plan and carried out the sale. These are all the previously named officers and agents of the Government participating in the transaction except the President against whom the charge is withheld on the theory that he was either uninformed or misinformed as to what was going on.

The Government has insistently pressed its charge of conspiracy throughout the proceedings in the trial court and here on appeal. We have therefore kept the

subject constantly before us in our study of the case and in our deliberations. It will be enough to say that we have found no evidence that sustains either the charge of conspiracy first made against representatives of the industry or the charge of conspiracy later made against officers and agents of the Government.

Resolving against the appellant the question of costs raised by its eighteenth assignment of error, the decree below is

Affirmed.

BUFFINGTON, *Circuit Judge.*

I concur in the conclusion reached by the court but, in one particular, on different grounds. The Act of Congress on which this sale rests provides, "That any property sold under this Act, except when sold to the United States, shall be sold only to American citizens, at public sale to the highest bidder, after public advertisement . . . unless the President stating the reasons therefor, in the public interest shall otherwise determine." In my judgment Congress by this twelfth section of the Act confided a personal trust and imposed a personal duty on the President. It was the President who was to determine and his determination involved his ascertainment of public necessity and his statement of the reasons thereto moving him. In my judgment this personal presidential trust could not be delegated and the delegation of it to Mr. Polk was not in accord with the statute, and therefore was without warrant of law. But the President's subsequent approval and ratification of what was done under the delegation constituted such personal action by the President as validates the sale. I therefore concur in the conclusion reached.

IN THE UNITED STATES CIRCUIT COURT OF APPEALS, FOR THE THIRD CIRCUIT.

October Term, 1924. No. 3160 (List No. 49).

United States,
Appellant,

v.

Chemical Foundation, Incorporated,
Appellee.

Appeal from the District Court of the United States, for the District of Delaware.

This cause came on to be heard on the transcript of record from the District Court of the United States, for the District of Delaware, and was argued by counsel.

On consideration whereof, it is now here ordered, adjudged, and decreed by this Court that the decree of the said District Court in this cause be, and the same is hereby affirmed.

Philadelphia,
March 26, 1925.

VICTOR B. WOOLLEY,
Circuit Judge.

(Endorsements: 3160. Order Affirming Decree. Received and Filed March 26, 1925. Saunders Lewis, Jr., Clerk.)

MANDATE.

(Filed May 4, 1925.)

UNITED STATES OF AMERICA, *ss.:*

THE PRESIDENT OF THE UNITED STATES OF AMERICA,
To the Honorable the Judges of the District Court of the United States for the District of Delaware,
(Seal)

GREETING:

Whereas, lately in the District Court of the United States for the District of Delaware, before you or some of you, in a cause between United States of America (complainant below), Appellant, and The Chemical Foundation, Incorporated (defendant below), Appellee, a decree was entered in the said District Court on the eighteenth day of February, 1924, which decree is of record in the office of the Clerk of the said District Court, to which reference is hereby made, and the same is hereby expressly made a part hereof, as by the inspection of the transcript of the record of the said District Court, which was brought into the United States Circuit Court of Appeals for the Third Circuit by virtue of an appeal by the United States agreeably to the Act of Congress, in such case made and provided, more fully and at large appears.

And whereas, in the term of October, in the year of our Lord one thousand nine hundred and twenty-four, the said cause came on to be heard before the said United States Circuit Court of Appeals on the said transcript of record and was argued by counsel:

On consideration whereof, it is now here ordered, adjudged and decreed by this Court that the decree of

the said District Court in this cause be, and the same is hereby affirmed.

Philadelphia,
March 26, 1925.

You, therefore, are hereby commanded that such execution and further proceeding be had in said cause, as according to right and justice, and the laws of the United States, ought to be had, the said appeal notwithstanding.

WITNESS, THE HONORABLE WILLIAM HOWARD TAFT, Chief Justice of the Supreme Court of the United States, at Philadelphia, the fourth day of May, in the year of our Lord one thousand nine hundred and twenty-five (1925).

Costs of .....
Clerk, . . . $.....
Printing Record $.....
Attorney . . $.....
$.....

SAUNDERS LEWIS, JR.,
Clerk of the U. S. Circuit Court of Appeals, Third Circuit.

IN THE UNITED STATES CIRCUIT COURT OF APPEALS, FOR THE THIRD CIRCUIT.

1925. No. 3160.

United States of America,
Complainant-Appellant.

v.

The Chemical Foundation, Incorporated,
Defendant-Appellee.

ASSIGNMENTS OF ERROR.

(Filed May 7, 1925.)

Now comes appellant, the United States of America, by its solicitors of record, and make and file this its assignments of error and upon which it relies as supporting its appeal from the judgment and decree entered on 26th day of March, 1925, in the Circuit Court of Appeals for the Third Circuit of the United States, and under which assignments of error said appellant seeks the reversal of the decision, judgment, and decree of said Circuit Court of Appeals:

I.

The Court erred in the construction and in sustaining the District Court's error in the construction of the Act of Congress approved October 6, 1917, known as the "Trading with the Enemy Act," and the amendments thereto, mentioned and described in the record in this cause and in the opinion of the District Court, and in the opinion of the Court herein, among other things, in holding that said act and amendments thereto

authorized the confiscation in whole or in part of the property mentioned and described in the record in this cause; that said act and amendments thereto authorized the sale or disposition of said property for less than its fair value; and authorized the Alien Property Custodian or other officers of the United States to regard the public interest or benefit as consideration in whole or in part for the sale or disposition of said property; that said act and amendments thereto conferred upon the Alien Property Custodian the powers of an absolute owner in and with respect to said property and the sale and disposition thereof; and that said act and amendments thereto authorized the sale and assignments of the properties mentioned and described in the record in this cause as, in the manner and for the consideration therein set forth; and in not holding that said act and amendments thereto required the Alien Property Custodian as a trustee or fiduciary having control of said properties in making sale thereof to make a fair sale for an adequate and proper consideration, with only the rights and powers and subject to the duties of a trustee with respect thereto; and that said alleged sales and assignments as shown in the record, were unauthorized by said act and amendments thereto, were in violation thereof, and were illegal, null and void and conferred no rights upon the appellee.

II.

The Court erred in holding and in sustaining the District Court's error in holding that said "Trading with the Enemy Act" and amendments thereto, as construed and interpreted by the Court, were valid and constitutional, and in not holding that said act and amendments thereto as so construed were in violation of the Constitution of the United States and amendments thereto, and were therefore unconstitutional,

null and void, in that, among other things, as so construed they constituted an invalid effort to delegate the legislative functions and powers of Congress; undertook to confer upon executive officers the power to confiscate property; undertook to authorize the confiscation of private property of American citizens, neutrals and other persons not enemies or allies of enemies within the meaning of said act; undertook to authorize executive officers of the Government to grant bounties to private industry; and were so construed otherwise in violation of the Constitution of the United States and amendments thereto.

III.

The Court erred in holding and in sustaining the District Court's error in holding that the alleged sales and assignments made by Francis P. Garvan to the appellee, the Chemical Foundation, Incorporated, were not in violation of the statutes and laws of the United States, and especially of Section 41 of the Criminal Code of the United States and in holding that Section 7, Clause (e) of the "Trading with the Enemy Act," as amended, made said statutes and laws including Section 41 of said Criminal Code inapplicable to this case; and in not holding that said alleged sales and assignments by said Francis P. Garvan to said appellee were in violation of said statutes and laws of the United States, and especially in violation of said Section 41 of said Criminal Code, and were null, void and of no effect, and that appellant was entitled to the relief prayed in the bill.

IV.

The Court erred in holding that one of the elements essential to a violation of Section 41 of the Criminal Code is that the offending person must be directly

or indirectly interested in the pecuniary profits or contracts of a corporation with which such offending person as an officer or agent of the United States transacts business, and in not holding that the only elements essential to a violation of said Section 41 are that the offending person shall be an officer or agent of the United States and, at the same time, an officer or agent of a corporation engaged in a transaction with the United States, and that the inquiry as to whether or not an officer of the government so transacting business with such corporation of which he is also an officer or agent has a pecuniary interest in the profits or contracts of such corporation is immaterial, and unessential to establish a violation.

V.

The Court erred in holding and in sustaining the District Court's error in holding that private sales and assignments of the properties mentioned and described in the record in this cause were lawfully authorized, and among other things in holding that the power to determine upon a private sale of alien property vested in the President by Section 12 of said "Trading with the Enemy Act," as amended, could be delegated to, vested in, or exercised by any other officer or person; that Frank L. Polk was lawfully authorized to exercise said powers; that the orders of said Frank L. Polk in this regard were legal or valid, or conferred any power to make private sales of said properties; or that the same were ever ratified by the President; and in not holding that the powers vested in the President by said Section 12 of said act, as amended, could only be exercised by him personally; that the authority alleged to have been vested in Frank L. Polk by the order of December 3, 1918, was sought to have been conferred upon him personally and not as an officer of the United

States, and that said alleged authority was for these and other reasons invalid; that said Frank L. Polk was without lawful authority to determine upon or authorize private sales of said properties; that said Frank L. Polk entered said orders under a misapprehension of the facts; that the orders of said Frank L. Polk of February 26, 1919, and April 5, 1919, were unlawful, null and void; that the same were never ratified by the President; that there was no valid or lawful authority to make private sales and assignments of said properties, and that the pretended sales and assignments of said properties as set forth in the record were unauthorized, illegal, null and void.

VI.

The Court erred in holding and in sustaining the District Court's error in holding that the President stating his reasons therefor lawfully authorized the Alien Property Custodian to sell at private sale to the appellee the properties involved in this suit upon such terms and conditions as the said Alien Property Custodian might see fit, and in holding that any lawful authority was given or had for said alleged sales or assignments; and in holding that the alleged authority to make said alleged private sales, or said alleged sales or assignments or any of them, were ever ratified by the President.

VII.

The Court erred in holding and in sustaining the District Court's error in holding that said alleged sales and assignments to appellee were lawful and valid; and in not holding that the same were unlawful, null and void, for the reasons among others that the same were not lawfully authorized; that they were not made in accordance with the alleged orders of Frank

L. Polk; that no effort was made to ascertain or to obtain the fair value of said properties; that many separate properties held in separate trusts were attempted to be sold in bulk and without any apportionment of the purchase price, and under such conditions as made any equitable apportionment thereof impossible; that there was a combination of all prospective bidders therefor and prospective purchasers thereof; that said properties were attempted to be sold in a manner and under such conditions as destroyed or impaired the value thereof; that the relations of the parties attempting to sell and purchase said properties to each other and to the subject matter were such as to make said alleged sales illegal; that the price was arbitrarily arrived at, and was grossly inadequate; that said alleged sales were not fair sales of said property for a just and adequate consideration, and for other reasons apparent upon the face of the record in this cause.

VIII.

The Court erred in holding and in sustaining the District Court's error in holding that the properties sought to be sold or assigned to appellee as set forth in the record were without substantial value, and that the same were sold for a valid and adequate consideration; and in not holding that the said properties were of large value individually and in the aggregate, and that the alleged sales and assignments thereof were for invalid and inadequate considerations and were illegal, null and void.

IX.

The Court erred in holding and in sustaining the District Court's error in holding that the alleged sales and assignments of properties to appellee as set forth in said record, did not constitute an unlawful confisca-

tion of property, and the unlawful granting of bounties to private industry; and in not holding that the same did constitute an unlawful confiscation of property and the unlawful granting of bounties to private industry, and were therefore illegal, null and void.

X.

The Court erred in holding and in sustaining the District Court's error in holding that the alleged sales and assignments set forth in the record were not induced by and made in pursuance and as a part of an unlawful combination, scheme or conspiracy, to do or cause to be done a lawful act in an unlawful manner and for an unlawful purpose, and to unlawfully restrain or monopolize the foreign and interstate commerce of the United States, in violation of the statutes and laws of the United States; and in not holding that said alleged sales and assignments were induced by and made in pursuance and as a part of such unlawful combination, scheme and conspiracy, and were illegal, null and void as against the United States.

XI.

The Court erred in holding and in sustainnig the District Court's error in holding that the various properties sought to have been sold and assigned by the Alien Property Custodian to appellee as shown by the record were at the beginning of the war, or at the time of the seizure thereof, all owned by subjects of Germany.

XII.

The Court erred in holding and in sustaining the District Court's error in holding that the properties mentioned and described in the record or any of them were sold and assigned to the appellee to be held by

it for the public benefit, or to be held upon the terms and conditions set forth in the charter of the appellee; and in not holding that the same were undertaken and intended to be sold and assigned to appellee without any reservation or limitation whatsoever, and that such alleged sales and assignments were illegal, null and void.

XIII.

The Court erred in holding and in sustaining the District Court's error in holding that the Haber Process patents were and are without substantial affirmative value to American citizens; and in sustaining the rulings of the District Court upon the evidence as to said Haber Process patents adverse to appellant as shown upon the record in this cause, and in sustaining the District Court's error in overruling the motion of appellant for subpœna *duces tecum* to be directed to the officers of the Atmospheric Nitrogen Corporation requiring them to produce their records and to appear and give evidence as to the use of said Haber Process patents by said corporation and the value thereof, reference being hereby made to the record in this cause for the terms of said motion and the ruling of the District Court thereon.

XIV.

The Court erred in sustaining the District Court's error in sustaining the objections of appellee to questions propounded to the witnesses Volwiler and Bolton as to processes used by the Abbott Laboratories and the E. I. du Pont de Nemours in the production of certain manufactured products produced and sold under licenses issued under certain patents involved in this suit, described in said questions of evidence and in sustaining the District Court's error in refusing to permit appellant to inquire into said processes and the

use thereof, upon the ground that it would require the disclosure of trade secrets and in thus denying the appellant the right to prove the use of said patents and processes and the value thereof.

XV.

The Court erred in sustaining the error of the District Court in each and every ruling of said District Court adverse to the appellant, upon the admission and exclusion of evidence and on motions for the production of books, records and testimony during the trial of the cause, which said motions, questions and rulings are fully set out in the record in this cause, and are hereby referred to as if herein copied at length.

XVI.

The Court erred in sustaining the District Court's error in each and every conclusion of law of said District Court as set out in its decision and rulings adverse to appellant during the trial in this cause, appearing at length upon the record; and in each and every conclusion of law contained in the opinion of said District Court in this cause made a part of the record therein.

XVII.

The Court erred in each and every of its conclusions of law as set out in its decision and contained in its opinion in this cause made a part of the record herein.

XVIII.

The Court erred in sustaining the error of the District Court in ordering and in itself ordering the taxation of the costs of the cause against the United States of America.

XIX.

The Court erred in sustaining the District Court's error in dismissing the bill of complaint herein and in denying the appellant the relief prayed for in each and all of the prayers of said bill.

UNITED STATES OF AMERICA,

By JOHN G. SARGENT,
Attorney General of the United States.

JAMES M. BECK,
Solicitor General of the United States.

HERMAN J. GALLOWAY,
Assistant Attorney General of the United States.

HENRY W. ANDERSON,
Special Assistant to the Attorney General.

Its Solicitors of Record.

IN THE UNITED STATES CIRCUIT COURT OF APPEALS, FOR THE THIRD CIRCUIT.

1925. No. 3160.

United States of America,
Complainant-Appellant,

v.

The Chemical Foundation, Incorporated,
Defendant-Appellee.

PETITION FOR APPEAL.

(Filed May 7, 1925.)

The above-named appellant, conceiving itself aggrieved, by the decree made and entered herein on the twenty-sixth day of March, 1925, in the above-entitled cause, does hereby appeal from said order and decree to the Supreme Court of the United States for the reasons specified in the assignment of errors which is filed herewith and it prays that this appeal may be allowed as the case involves more than $1000, besides costs and there is a right to an appeal under Section 241, Judicial Code, and that a transcript of the record, proceedings and papers upon which such order was made, duly authenticated, may be sent to the Supreme Court of the United States. Said appellant further prays the Court that since the entire evidence in this cause taken was by order of the District Court of the United States for the District of Delaware, filed July 23, 1923, printed at great expense, and since the District Court of the United States for the District of Delaware, in its order filed February 26, 1924, allowing an appeal to this

court, ordered that appellant be relieved of the requirement of reducing the evidence in this cause to narrative form and ordered that the entire evidence that had theretofore been printed in accordance with the order of said District Court be included and inserted in the transcript of the record forwarded to this court, and since sufficient copies of said printed evidence are now available for the purpose of this appeal that the parties hereto be relieved of the requirement of reducing the evidence herein to a narrative form, and that this court enter an order requiring the entire evidence, so printed as aforesaid, to be inserted and included in the transcript of the record to be forwarded to said Supreme Court of the United States.

UNITED STATES OF AMERICA,

By JOHN G. SARGENT,
Attorney General of the United States.

JAMES M. BECK,
Solicitor General of the United States.

HERMAN J. GALLOWAY,
Assistant Attorney General of the United States.

HENRY W. ANDERSON,
Special Assistant to the Attorney General
Its Solicitors of Record.

IN THE UNITED STATES CIRCUIT COURT OF APPEALS, FOR THE THIRD CIRCUIT.

1925. No. 3160.

United States of America,
Complainant-Appellant,

v.

The Chemical Foundation, Incorporated,
Defendant-Appellee.

ORDER ALLOWING APPEAL.

(Filed May 12, 1925.)

The appellant herein having this day filed in open court a petition for appeal to the Supreme Court of the United States, and its assignment of errors, and further praying that the entire evidence in this cause, which has heretofore been printed in accordance with an order of the District Court of the United States for the District of Delaware, and which was, by order of the District Court of the United States for the District of Delaware, filed February 26, 1924, included and inserted in the transcript of record forwarded to this court, and further praying that said appellant be relieved of the requirement of reducing the evidence herein to a narrative form, and the Court having considered the same and having heard counsel thereon, it is this eleventh day of May, 1925.

ORDERED, that appellant's petition for appeal be and the same is hereby allowed and that appellant herein be relieved of the requirement of reducing the

evidence herein to a narrative form and that the entire evidence in this cause, which has heretofore been printed in accordance with the order of the said District Court of the United States for the District of Delaware and which was forwarded to this court be included and inserted in the transcript of the record to be forwarded to the Supreme Court of the United States.

JOSEPH BUFFINGTON,
United States Circuit Judge.

IN THE UNITED STATES CIRCUIT COURT OF APPEALS, FOR THE THIRD CIRCUIT.

1925. No. 3160.

United States of America,
Complainant-Appellant,

v.

The Chemical Foundation, Incorporated,
Defendant-Appellee.

CITATION.

(Seal)

THE UNITED STATES OF AMERICA,

To the Chemical Foundation, Incorporated:

You are hereby cited and admonished to be and appear at a Supreme Court of the United States, to be holden at Washington, District of Columbia, within thirty days pursuant to an appeal filed in the clerk's office of the Circuit Court of Appeals of the United

States for the Third Circuit, wherein the United States is appellant and the Chemical Foundation, Incorporated, is appellee, to show cause, if any there be, why the judgment and decree in the said appeal mentioned should not be corrected, and speedy justice should not be done to the parties in that behalf.

WITNESS, the Honorable Joseph Buffington, United States Circuit Judge, this eleventh day of May, A. D., one thousand nine hundred and twenty-five.

JOSEPH BUFFINGTON,
United States Circuit Judge.

Service accepted for the Chemical Foundation, Incorporated, appellee, this day of , 1925.

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Solicitors for the Defendant-Appellee.

CLERK'S CERTIFICATE.

UNITED STATES OF AMERICA,
EASTERN DISTRICT OF PENNSYLVANIA, } *Sct.:*
THIRD JUDICIAL CIRCUIT,

I, Saunders Lewis, Jr., clerk of the United States Circuit Court of Appeals, for the Third Circuit, do hereby certify the foregoing to be a true and faithful copy of the original record and proceedings in this court in the case of: United States, appellant, v. Chemical Foundation, Incorporated, appellee, No. 3160, on file, and now remaining among the records of the said court, in my office.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the seal of the said court, at Philadelphia, this

(Seal) day of May, in the year of our Lord one thousand nine hundred and twenty-five and of the Independence of the United States the one hundred and forty-ninth.

SAUNDERS LEWIS, JR,
Clerk of the U. S. Circuit Court of Appeals, Third Circuit.